MEMORANDUM

November 8, 2010

TO: Gude Landfill – Nature and Extent Study Report

FROM: Stephen Lezinski, Engineer III, DEP/DSWS

SUBJECT: Post-Closure Care Monitoring and Maintenance

The Gude Landfill is the oldest formal landfill in Montgomery County. The Landfill was used for the disposal of municipal solid waste and incinerator residues from 1964 and 1982. The site encompasses approximately 162 acres, of which approximately 100 acres were used for waste disposal. The Landfill is currently owned and maintained by the County DEP, Division of Solid Waste Services. The Landfill is located on the northern side of East Gude Drive and extends to the northern side of Southlawn Lane with the primary entrance point at 600 East Gude Drive in Rockville, Maryland.

The Gude Landfill is governed by the state of Maryland under the Code of Maryland Regulations (COMAR) and as directed by the Maryland Department of the Environment (MDE). COMAR Title 26, Subtitle 04, Section 7 (COMAR 26.04.07), provides regulations for solid waste management. Although the Gude Landfill is not currently an active landfill operating under an active Refuse Disposal Permit in Maryland, MDE has the responsibility and authority to protect the quality of the environment and public health and safety under COMAR 26.04.07.03.

Post-closure care monitoring and maintenance activities at the Gude Landfill are required under COMAR 26.04.07.22. Monitoring and maintenance activities include: the inspection of the cover system; notation of any surface drainage irregularities or areas experiencing erosion; notation of any surface expressions of leachate; checking the status of the monitoring wells; and associated maintenance of irregularities or problems noted during the inspection at the closed landfill under COMAR 26.04.07.22.

To comply with COMAR requirements, the County Department of Environmental Protection (DEP), Division of Solid Waste Services has maintained a landfill maintenance contract to perform site repairs since 1984 to present day. Although site repairs have occurred since 1984, the following Memorandum primarily presents a detailed summary of DEP's efforts to actively maintain the cover system, manage stormwater and repair leachate seeps at the Gude Landfill in compliance with COMAR 26.04.07.22 over the last two (2) years.

<u>Cover System Maintenance</u>

To protect the integrity of the Landfill cover system that was placed over the waste mass, maintenance is required to correct surface depressions, ponding water and areas experiencing

erosion. Surface depressions on the Landfill are typically caused by differential settlement through natural decomposition of the waste mass. Surface depressions that contain ponding water or areas that exhibit erosion are regraded with soil to provide positive drainage, seeded and stabilized. These corrective measures help to reduce infiltration, prevent sediment dispersion and redirect runoff to existing swales and stormwater collection infrastructure. Other areas of the Landfill require additional maintenance measures that can include surface oriented infiltration trenches (filter fabric, stone and pvc pipe) to collect and redirect runoff. Refer to Photos 1-3 for documentation of typical cover system maintenances. Cover system maintenance occurred in: 2009 – January, February, March and July; 2010 – May and June.

Photo 1 - Stormwater Ponding (before repairs)

Photo 2 – Drainage Channel Installation (during repairs)

Photo 3 – Drainage Channel (after repairs)

Stormwater Management

To reduce the potential for precipitation to infiltrate the cover system (and enter the waste mass) and to protect regional surface water quality, the management of stormwater is required on the Landfill. With respect to post-closure care monitoring and maintenance, stormwater management includes: the inspection of the cover and drainage systems; collection and management of stormwater discharges on and off-site; and prevention of potential stormwater pollutant (i.e. non-stormwater) discharges. Post-closure care maintenance responsibilities are referenced under COMAR 26.04.07.22. Stormwater and non-stormwater discharge inspections and requirements are referenced within the 2001 Gude Landfill Stormwater Pollution Prevention Plan (SWPPP). The SWPPP is updated annually and is governed under the General Discharge Permit for Stormwater Associated with Industrial Activities (Permit No. 02-SW). Future site redevelopment and construction activities at the Gude Landfill will require compliance under the existing General Permit, the County National Pollutant Discharge Elimination System (NPDES) Permit (Permit No. MDR10, State Discharge Permit No. 09GP) and the Maryland Stormwater Management Act of 2007.

In 1992-1993, Montgomery County in conjunction with SCS Engineers developed engineered plans and specifications for a series of stormwater infrastructure improvements at the Gude Landfill. The site improvements were implemented to collect and direct stormwater off of the landfill site in 1993-1994. The site improvement work included, but is not limited to the construction of: stormwater diversion berms; drainage swales channels with conveyance piping; stormwater collection manholes; sediment basin upgrades to accommodate increased stormwater volume; access road construction, etc. Refer to Photos 4-5 for documentation of typical stormwater infrastructure improvements. General stormwater management system maintenance occurred in: 2009 – January, February, March and July; 2010 – May and June.

Photo 4 – HDPE Manhole with upslope Drainage Channel for Stormwater Collection

Photo 5 – Concrete Inlet with upslope Drainage Channel for Stormwater Collection

Leachate Seep Repairs

To protect the integrity of the Landfill cover system and prevent non-stormwater discharges, maintenance is required to repair surface expressions of leachate at the Landfill. Leachate is considered any form of precipitation that comes into contact with waste. Leachate seeps typically occur on areas of the Landfill where the cover system soil depth is shallow (less than two feet). Post-closure care maintenance responsibilities are referenced under COMAR 26.04.07.22 and prevention of non-stormwater discharges are referenced within the County SWPPP Plan, General Permit and NPDES Permit.

Leachate seeps on pre-regulatory era landfills (Pre-RCRA) are typically repaired in a manner that redirects the surface expression of leachate back into the waste mass. This procedure allows for natural attenuation of the leachate since the Gude Landfill does not have a leachate collection system. Leachate seeps repair work involves the installation of a subsurface oriented infiltration trench, which includes: excavating the surface expression (soil and waste) to an adequate depth to contain the seep; lining the trench with filter fabric; placing stone in the trench as infiltration media; covering the trench with two feet minimum of soil to surface grade with seed and straw. Excavated soil and waste are transported to other areas of the Landfill site to be buried and covered with two feet minimum of soil with seed and straw. Refer to Photos 6-9 for documentation of typical leachate seep repairs. Leachate seep repair work occurred in: 2009 – January, February, March and July; 2010 – May and June.

Photo 6 - Leachate Seep (before repairs)

Photo 7 – Infiltration Trench Installation (during repairs)

Photo 8 – Disturbed Area of Leachate Seep (during repairs)

Photo 9 – Area of Leachate Seep (after repairs)

Topic: Landfill Gas Management - Chronology
Author: Stephen Lezinski, Engineer III, Montgomery County DEP/DSWS
Date: November 4, 2010

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Per COMAR 26.04.07.03B(9) – *"A facility may not be designed or operated in such a manner that the concentration of explosive gases generated by the facility exceeds 25 percent of the lower explosive limits for the gases in facility structures, excluding gas control or recovery system components, and the lower explosive limit for the gases at the property boundary."* According to this standard, methane concentrations resulting from the presence of landfill gas in on-site structures at the landfill site cannot exceed 1.25 percent by volume, and methane concentrations cannot exceed 5.00 percent by volume at the landfill property boundary

To comply with this requirement, the County Department of Environmental Protection (DEP), Division of Solid Waste Services has maintained an active landfill gas collection system at the Gude Landfill since 1985. Following receipt of the operating Contractor's notice to terminate the gas lease agreement at the gas-to-energy facility, the County implemented a series of administrative processes, studies and infrastructure improvements to ensure the active collection of landfill gas starting in November 2003 to present day.

The following Memorandum presents a detailed summary of DEP's efforts to actively manage landfill gas (i.e. methane) at the Gude Landfill in compliance with COMAR 26.04.07.03B(9):

- Original Landfill Gas Collection System and Gas-to-Energy Facility Installation – In December 1983, Montgomery County executed a gas lease agreement with Central Plants, Inc. (CPI) to install a landfill gas collection system and gas-to-energy facility at the Gude Landfill, which became operational in 1985. The gas-to-energy facility produced a range of 1.5 – 2.7 megawatts (MW) of power for the next 20-year period. Over the Contract term, the gas collection system was expanded from 44 gas extraction wells to 54 wells. Underground gas conveyance piping was also modified to aboveground piping to account for differential settlement of the waste mass. The last holder of the gas lease agreement, Covanta Power Pacific, Inc. (CPPI), notified the County in November

2003 of its desire to terminate the lease agreement in June 2004. The lease agreement ended in 2006 when the gas-to-energy facility was decommissioned.

- Landfill Gas Contract Procurement – A competitively bid Task Order was issued for Siting, Design, Permitting, Construction Quality Assurance and System O&M for a landfill gas management system in January/February 2004. The Contract was awarded to SCS Engineers.

- Landfill Gas Flare Station Procurement – Concurrently with the landfill gas migration evaluation, the County developed and issued (November 2003-May 2004) an Invitation for Bid (IFB) for the manufacturing and delivery of an Enclosed Gas Flare, Blower and Control Panel Equipment System. An accelerated procurement schedule was established with the County office of Procurement and a contract was issued to LFG Specialties for the flare equipment system. SCS Engineers was the County's technical advisor during project design, construction and operation.

- Landfill Gas Migration Evaluation – Concurrently with the Landfill Gas Flare Station procurement and installation, in June/July 2004, two consulting firms (SCS Engineers and Geosyntec Consultants) under contract with the County performed a landfill gas migration evaluation. Each evaluation confirmed methane gas concentrations exceeded the 5.00 percent threshold limit at and beyond the northwest property boundary of the Landfill. Photos 1 and 2 presents a gas extraction well head assembly and gas collection piping.

- Landfill Gas Migration Assessment – In April 2005, 20 temporary landfill gas monitoring wells were installed approximately 150-200 feet northwest from the Gude Landfill perimeter fence near the Derwood Station South residential community. Methane gas was detected in a group of six temporary monitoring wells (#3-8).

- Methane Detector Installation – In May/June 2005, the County contacted the Derwood Station South Home Owners Association (HOA) and individual homeowners to inform them of potential landfill gas migration. County and SCS Engineers' representatives tested the interior of homes for the presence of methane gas. The County offered to install methane gas detectors in homes adjacent to the Gude Landfill of which, twelve (12) homeowners accept.
- MDE Notification – The County via site inspection with MDE on June 15, 2005 and via letter on November 14, 2005 updated MDE on the landfill gas investigation, subsequent monitoring activities and mitigation efforts along the northwest property boundary of the Gude Landfill.

- Landfill Gas Flare Station Installation – The County received a permit to construct from MDE, Air and Radiation Management Administration (ARMA) to build and operate the Flare Station with two enclosed ground flares in June 2004, which were installed in May 2005. With the operation of the Flare Station, methane gas concentrations dropped

substantially from May-September 2005 along the northwest property boundary of the Landfill. Photo 3 presents the Flare Station.

- Landfill Gas System Operation and Maintenance – SCS Engineers performed operation and maintenance of the landfill gas collection system 2004-2009. The County performed daily inspections of the Flare Station from 2005-2009.

- Landfill Gas Monitoring Well Installation – In April 2005, County DEP started to monitor the temporary gas monitoring wells (#3-8) near the Derwood Station South residential community, which indicate on-going gas exceedences. In September-October 2005, the County authorized SCS Engineers to install seven (7) permanent landfill gas monitoring wells (W03-W09) along the northwest property, which will be monitored weekly by DEP. The 20 temporary landfill gas monitoring wells were removed in late 2005.

- Landfill Gas System Expansion – Due to continued detections of methane exceedences along the northwest property boundary, the County issued a Task Order for the design/build of a landfill gas extraction system expansion. In February 2006, the County awarded the Contract to SCS Engineers. Twenty three (23) landfill gas extraction wells (EW-100 to EW-132) were installed with connections to the Flare Station from March 2006 – April 2008.

- New Landfill Gas-to-Energy Facility Installation – The County in conjunction with the Northeast Maryland Waste Disposal Authority developed a Request for Proposal (RFP) to design, construct, and operate a new landfill gas-to-energy (LFGE) facility at the Gude Landfill. In December 2007, the Authority signed a contract with SCS Engineers for the LFGE project. The LFGE Facility beneficially uses landfill gas in one (1) 0.8 MW Jenbacher GS 316 internal combustion engine to generate electricity in conjunction with Flare Station operations. The MDE/ARMA permit to construction was received in September 2008. Construction was initiated in December 2008 and start-up operations and power export to grid occurred in June 2009. Photo 4 presents the Gas-to-Energy Facility.

- Preparation of Formal Landfill Gas Monitoring Plan – MDE to County Letter dated December 12, 2008 – formalize current monitoring program for landfill gas and investigate the placement of additional landfill gas monitoring wells. Prepare and submit a monitoring plan for MDE approval. MDE approved the County Landfill Gas Monitoring Plan on April 22, 2009. Landfill gas monitoring and reporting to occur on a quarterly basis to MDE.

- Dioxin/Furan Air Emissions Testing – At the request of the Gude Landfill Concerned Citizens, a community-based advisory group, the County in conjunction with SCS Engineers conducted dioxin and furan testing of the enclosed stack flares and the gas-to-energy facility in November 2009 and March 2010. SCS Engineers performed an initial air emissions screening analysis that concluded dioxin and furan emissions are controlled

below EPA inhalation unit risk factor thresholds. EA Engineering performed a similar analysis that also included health risk-based screening levels that were derived from EPA unit risk factors specified under the Maryland Toxic Air Pollutant (TAP) regulations (COMAR 26.11.15 & 16). EA determined that both the enclosed stack flares and gas-to-energy facility meet the required 98% destruction efficiency requirements for non-methane organic compounds (that includes dioxins and furans) and associated emission levels will not adversely affect public human health.

- Landfill Gas Monitoring Well Installation – In June 2010, the County in conjunction with SCS Engineers installed additional landfill gas monitoring wells along areas of the perimeter property boundary (at 300-foot spacing) of the Gude Landfill. Ten (10) new gas monitoring wells were installed along the northwest and southwest property boundary (W-01, W-02, W-10, W-11, W-25 thru W-30). Future gas monitoring wells are to be located on the northeast and southeast options of the Landfill.

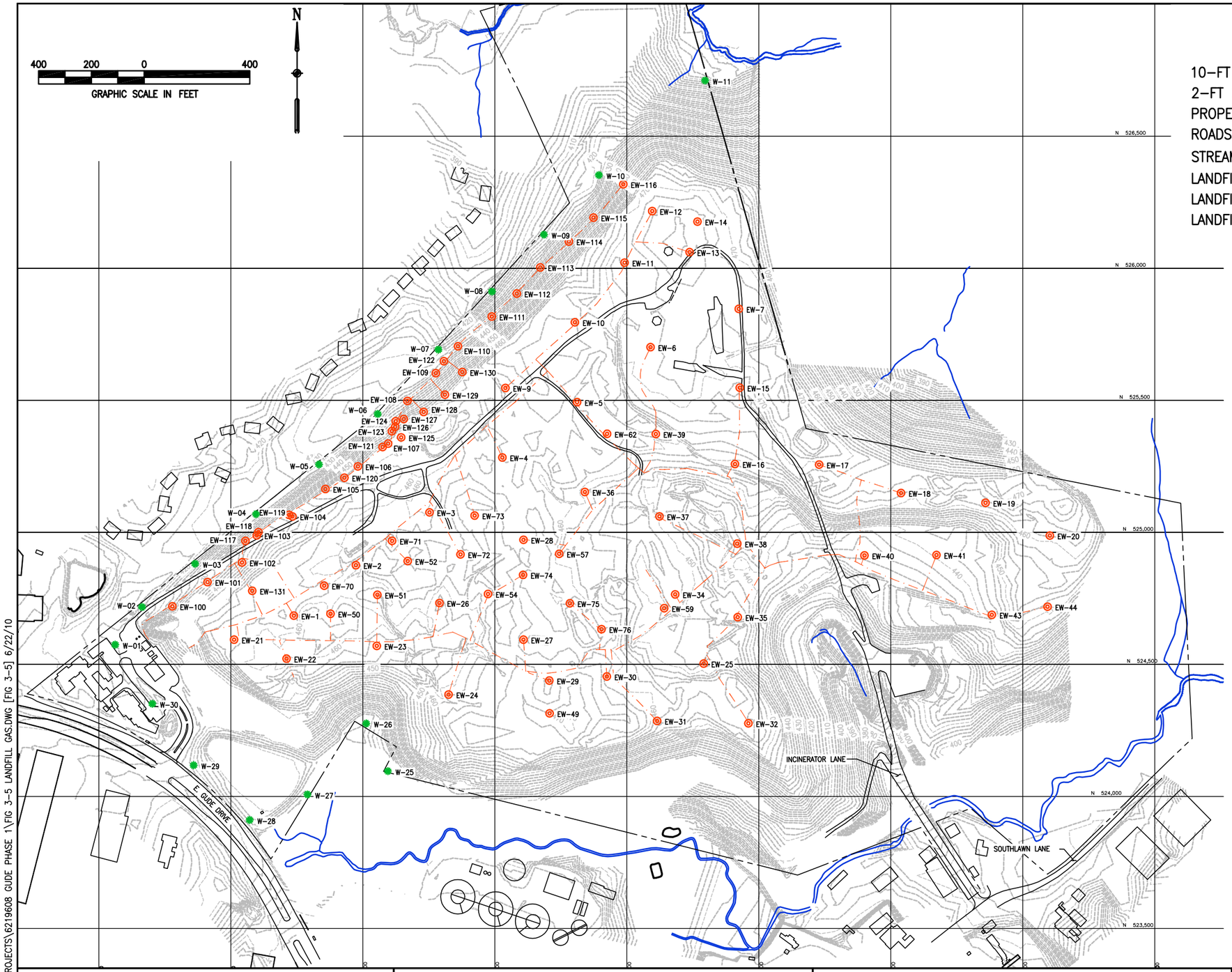
Attachment:
Figure 3-4: Existing Gude Landfill Gas Extraction and Monitoring Systems

Photo 1 – Gas Extraction Well Head Assembly

Photo 2 – Gas Collection Piping

Photo 3 – Landfill Gas Flare Station

Photo 4 – Landfill Gas-to-Energy Facility



LEGEND

- 10–FT CONTOUR — 400
- 2–FT CONTOUR
- PROPERTY BOUNDARY
- ROADS
- STREAM/BODY OF WATER
- LANDFILL GAS EXTRACTION PIPING
- LANDFILL GAS EXTRACTION WELL
- LANDFILL GAS MONITORING WELL — W-07

NOTES:

1. 2009 TOPOGRAPHY COMPILED BY APPLIED MAPPING SOLUTIONS, INC. USING PHOTOGRAMMETRIC METHODS WITH PHOTOGRAPHY DATED 06/24/09 AND SUPPLEMENTED WITH FIELD SURVEY PERFORMED BY C.C. JOHNSON & MALHOTRA, P.C., OCTOBER 2009.

2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983/91 (NAD–83/91). COORDINATE SYSTEM IS MARYLAND STATE PLANE, U.S. SURVEY FEET. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD–88) WITH ELEVATIONS SHOWN IN FEET.

3. THE PROPERTY BOUNDARY WAS LAID OUT AND THE PLAT THEREOF PREPARED BY A REGISTERED PROPERTY LINE SURVEYOR OF THE STATE OF MARYLAND, IN COMPLIANCE WITH SECTION 3–108 OF THE REAL PROPERTY ARTICLE OF THE ANNOTATED CODE OF MARYLAND, EDITION 2005.

4. THE PROPERTY BOUNDARY REPRESENTS THE LANDS OWNED BY MONTGOMERY COUNTY, MARYLAND KNOWN AS THE GUDE LANDFILL WHICH IS A COMPILATION OF THREE DEEDS, LISTED BELOW, RECORDED IN THE LAND RECORDS OF MONTGOMERY COUNTY, MARYLAND, WITHOUT BENEFIT OF FULL TITLE COMMITMENT.
   LIBER 2975 FOLIO 213
   LIBER 4501 FOLIO 453
   LIBER 5174 FOLIO 309

FILE PATH: Q:\PROJECTS\62196\08 GUDE PHASE 1\FIG 3-5 LANDFILL GAS.DWG [FIG 3-5] 6/22/10

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

GUDE LANDFILL
NATURE AND EXTENT STUDY PLAN
MONTGOMERY COUNTY, MARYLAND

Figure 3–4
EXISTING GUDE LANDFILL GAS EXTRACTION AND MONITORING SYSTEMS

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PL	JP	FEB. 2010	62196.08
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BR	JK	–	3–4

Topic: Stormwater Infrastructure Review
Gude Landfill, Montgomery County
Author: Laura Jo Oakes, P.E.
Date: 17 November 2010

PURPOSE

EA Engineering, Science, and Technology, Inc. (EA) prepared this Technical Memorandum to summarize the findings of the Stormwater Infrastructure Review at the Gude Landfill in an effort to assist the Montgomery County (the County) Department of Environmental Protection – Division of Solid Waste Services (DEP/DSWS) with the assessment and potential remediation of the site. EA has completed the review of drawings and performed a review and inventory of stormwater infrastructure at the site. The field review, including completed field forms and drawings were included in the *Gude Landfill Nature and Extent Study Plan* finalized in July 2010.

STORMWATER DATA REVIEW

EA reviewed drawings prepared by SCS Engineers (SCS) titled "Gude Landfill Post Closure Engineering Design and Management Tasks," dated 1992. These drawings were provided by the County for location and evaluation of the existing stormwater management structures at the Landfill. EA created a pre-inspection inventory list of existing site stormwater management infrastructure, which identified more than 90 stormwater management devices from the SCS documents. The inventory included swales, berms, inlet structures, outlet structures, culverts, detention ponds, and sediment basins.

Stormwater Field Review

The pre-inspection inventory list was used to establish the baseline condition for comparison with stormwater structures identified during the field review. Structures were located and visually inspected in the field to assess the integrity of the structure, and indentify any impediments to the structure functioning properly.

EA performed the field review of the stormwater structures at the site on 5 November 2009, with a supplementary review conducted on 11 November 2009. Many of the structures identified in the pre-inspection inventory were located and assessed; however, approximately 12 stormwater management structures identified in the pre-inspection inventory could not be located. Additional structures not identified in the pre-inspection inventory list were also located in the field. A total of 103 stormwater management structures were located and assessed in the field. A Stormwater Structure Map is included as Figure 3-2 and indicates the location of the inspected structures. Individual inspection forms detailing each structure identified were prepared and are included in the *Nature and Extent Study Plan* (EA 2010).

In general, most of the structures appeared to function as intended; however, the structures did not appear to be receiving regular maintenance. In addition, the Landfill was heavily overgrown with vegetation, which was impacting the operations of many of the stormwater management structures.

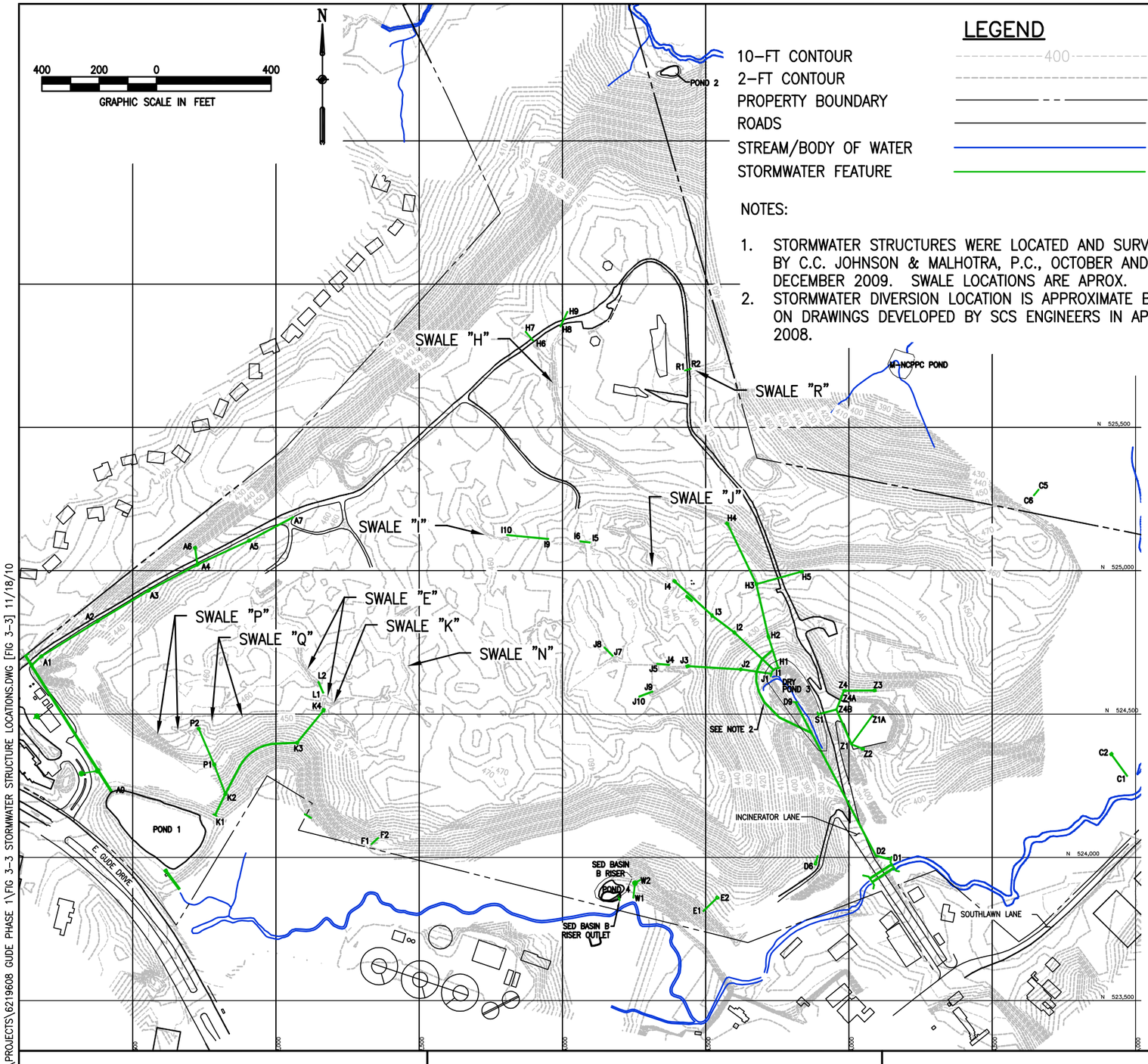
Drainage Map

EA developed a drainage area map (Figure 3-3) for the site based upon current topography and as-built drainage infrastructure information. These boundaries indicate the catchment areas and flow directions for surface runoff from the cap. The drainage area boundaries were delineated based upon the contours and surface features collected in the 2009 survey. Boundaries were truncated at the property boundary or were terminated where no topography was collected. Drainage areas were also delineated to drainage structures where contours indicated flow concentrations. In other circumstances where contours did not clearly define a drainage feature, such as a ditch or graded bench, a boundary was interpreted based upon features shown in the design drawings entitled "Gude Landfill Post Closure Engineering Design and Management Tasks" prepared by SCS Engineers and dated 22 June 1992. Some drainage areas on the cap are captured and conveyed by storm drains that then discharge further downgradient at the Landfill perimeter or into another drainage area. Areas where runoff is conveyed by drainage infrastructure are indicated by a bold arrow.

Stormwater Data Gaps

EA reviewed drawings prepared by SCS Engineers and compiled a pre-inspection inventory of stormwater structures. In addition, EA conducted the field review of stormwater structures. Based upon the comparison of the pre-inspection inventory and the field review, EA did not identify additional data gaps in the stormwater network at the Landfill.

Attachments:
Figure 3-2: Stormwater Structure Map
Figure 3-3: Drainage Area Map



Point No	Description	Condition
A0	Manhole to 60" CMP	Not available
A1	Inlet to 18" HDPE	Good
A2	Inlet to 18" HDPE	Vegetative overgrowth and debris
A3	Inlet to 18" HDPE	Vegetative overgrowth and debris
A4	Inlet to 18" HDPE	Vegetative overgrowth and debris
A6	Inlet to 18" HDPE	Rip rap settlement
A5	Inlet to 18" HDPE	Rip rap settlement
A7	Inlet to 24" HDPE	Heavy vegetative overgrowth
P1	Inlet to 18" CPP	Vegetative overgrowth and debris
P2	Inlet to 18" CPP	Good
K2	Tie in Point for 18" CPP To 30" CPP	Vegetative overgrowth
K3	Inlet to 30" CPP	Vegetative overgrowth
K4	Inlet to 30" CPP	Minimal erosion
L1	24" CPP Culvert	Heavy vegetative overgrowth
L2	24" CPP Culvert	Moderate vegetative overgrowth
J1	30" CPP Outlet	Trees in channel
J2	Inlet to 24" CPP	Vegetative overgrowth and debris
J3	Inlet to 24" CPP	Concrete bowing – overgrowth
J4	24" CMP Culvert	Good
J5	24" CMP Culvert	Good
J7	24" CPP Culvert	Vegetative overgrowth
J8	24" CPP Culvert	Good
J9	24" CMP Culvert	Vegetative overgrowth
J10	24" CMP Culvert	Vegetative overgrowth
I1	30" CPP Outlet	Trees in channel
I2	Inlet to 24" CPP	Concrete in need of repair
I3	Inlet to 24" CPP	Vegetative overgrowth
I4	Inlet to 24" CPP	Vegetative overgrowth and debris
I5	24" RCP Culvert	Heavy vegetative overgrowth
I6	24" RCP Culvert	Heavy vegetative overgrowth
I9	24" RCP Culvert	Heavy vegetative overgrowth
I10	24" RCP Culvert	Good
H2	Inlet to 24" CPP	Heavy vegetative overgrowth
H3	Tie in Point for 18" pipe to 24" pipe	Excellent
H5	Inlet to 24" CPP	Potentially clogged with debris
H4	Inlet to 24" CPP	Rip rap settlement and vegetation
H6	12-18" CMP Culvert	Minimal erosion
H7	12-18" CMP Culvert	Good
H8	15" CMP Culvert	Not available
H9	15" CMP Culvert	Not available
Z1	Tie in Point for 18" and 8" pipes to 24" pipe	Silt fence around inlet
Z1A	Inlet to 8" pipe	
Z2	Inlet to 18" pipe	Rip rap settlement and vegetation
Z3	Inlet to 18" pipe	Silt fence around inlet and vegetation
Z4	Inlet to 18" pipe	Silt fence around inlet and vegetation
Z4A	Inlet to 24" pipe	
Z4B	Tie in Point for 18" and 8" pipes to 24" pipe	
S1	30" RCP Outlet	Heavy vegetative overgrowth
D9	Inlet to 30" RCP	Debris around inlet
D2	Inlet	Debris around inlet
D1	Outlet	Debris around inlet
R1	8" PVC Culvert	Not available
R2	8" PVC Culvert	Not available
C2	Inlet to 18" CPP	Debris around inlet
C1	18" CPP Outlet	Debris around inlet
B5	12" Concrete Culvert	Minimal erosion and leaf debris
B6	12" Concrete Culvert	Debris around inlet
E2	Inlet to 18" CPP	Rip rap settlement
E1	18" CPP Outlet	Good
W2	15" RCP Culvert	Vegetative overgrowth
W1	15" RCP Culvert	Good
Sed Basin B Riser	15" Pipe	Requires further evaluation
Sed Basin B Riser Outlet	15" Pipe	Requires further evaluation

FILE PATH: Q:\PROJECTS\6219608 GUDE PHASE 1\FIG 3-3 STORMWATER STRUCTURE LOCATIONS.DWG [FIG 3-3] 11/18/10

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

GUDE LANDFILL
NATURE AND EXTENT STUDY PLAN
MONTGOMERY COUNTY, MARYLAND

Figure 3-2
STORMWATER STRUCTURE LOCATION MAP

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REO	REO	FEB. 2010	62196.08
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NOTES:

1. THIS FIGURE REPRESENTS ONSITE DRAINAGE AREA BOUNDARIES BASED UPON 2009 TOPOGRAPHY COMPILED BY APPLIED MAPPING SOLUTIONS, INC. USING PHOTOGRAMMETRIC METHODS WITH PHOTOGRAPHY DATED 06/24/09 AND SUPPLEMENTED WITH FIELD SURVEY PERFORMED BY C.C. JOHNSON & MALHOTRA, P.C., OCTOBER 2009.

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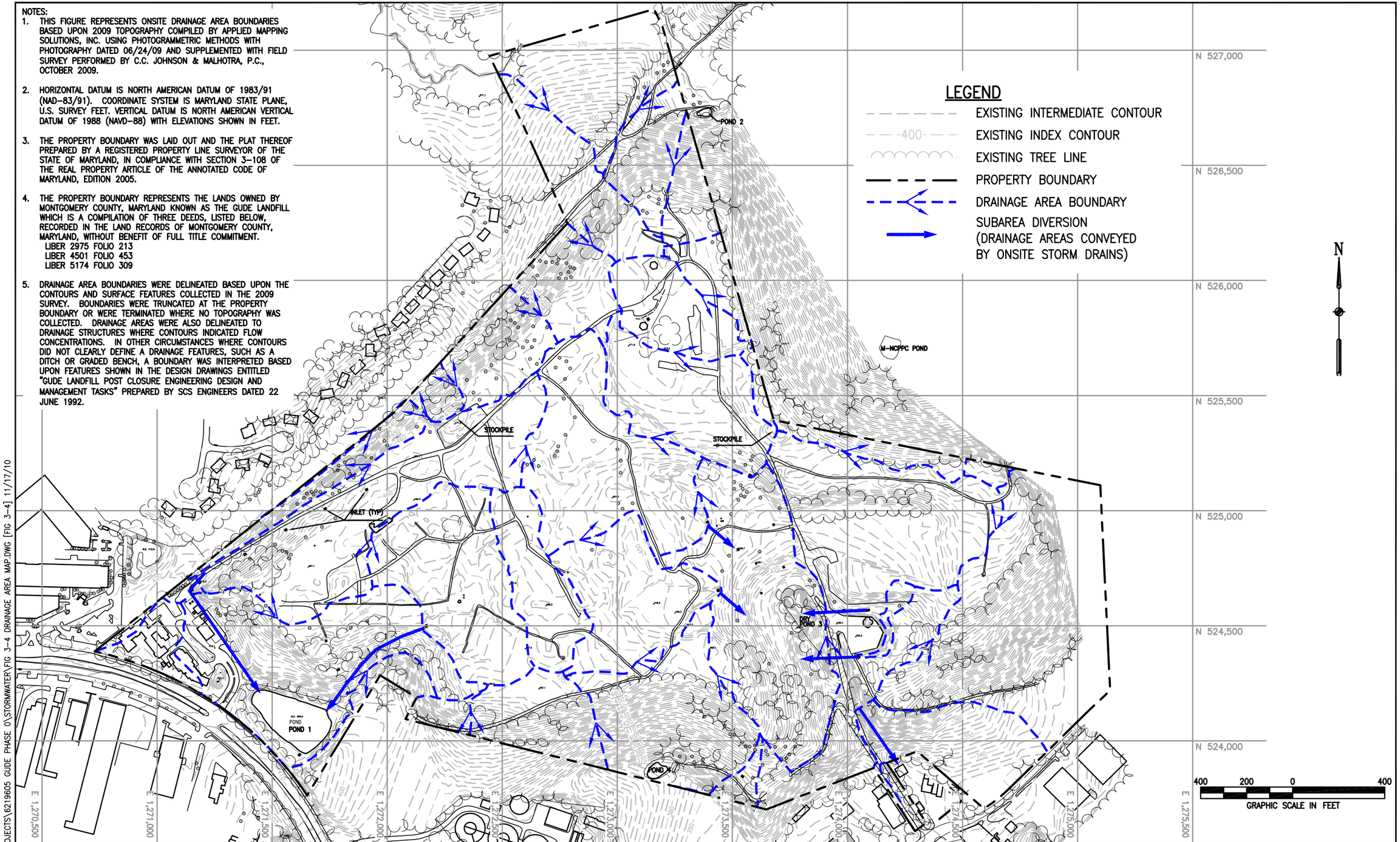
   LIBER 2975 FOLIO 213
   LIBER 4501 FOLIO 453
   LIBER 5174 FOLIO 309

5. DRAINAGE AREA BOUNDARIES WERE DELINEATED BASED UPON THE CONTOURS AND SURFACE FEATURES COLLECTED IN THE 2009 SURVEY. BOUNDARIES WERE TRUNCATED AT THE PROPERTY BOUNDARY OR WERE TERMINATED WHERE NO TOPOGRAPHY WAS COLLECTED. DRAINAGE AREAS WERE ALSO DELINEATED TO DRAINAGE STRUCTURES WHERE CONTOURS INDICATED FLOW CONCENTRATIONS. IN OTHER CIRCUMSTANCES WHERE CONTOURS DID NOT CLEARLY DEFINE A DRAINAGE FEATURES, SUCH AS A DITCH OR GRADED BENCH, A BOUNDARY WAS INTERPRETED BASED UPON FEATURES SHOWN IN THE DESIGN DRAWINGS ENTITLED "GUDE LANDFILL POST CLOSURE ENGINEERING DESIGN AND MANAGEMENT TASKS" PREPARED BY SCS ENGINEERS DATED 22 JUNE 1992.



EA ENGINEERING, SCIENCE, AND TECHNOLOGY

GUDE LANDFILL
NATURE AND EXTENT STUDY PLAN
MONTGOMERY COUNTY, MARYLAND

FIGURE 3-3
DRAINAGE AREA MAP

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.
PL	JP	FEB. 2010	62196.08
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FILE PATH: Q:\PROJECTS\62196O5 GUDE PHASE O\STORMWATER\FIG 3-4 DRAINAGE AREA MAP.DWG [FIG 3-4] 11/17/10

County Contact and Website Documentation

Montgomery County
Department of Environmental Protection
Division of Solid Waste Services

County Contact Information

Stephen T. Lezinski, Engineer III
Montgomery County Processing Facility and Transfer Station
16101 Frederick Road
Derwood, MD 20855
Tel: (240)-777-6590
Email: steve.lezinski@montgomerycountymd.gov

Peter R. Karasik, Central Operations Section Chief
Montgomery County Processing Facility and Transfer Station
16101 Frederick Road
Derwood, MD 20855
Tel: (240)-777-6569
Email: peter.karasik@montgomerycountymd.gov

Remediation Webpage Address

http://www.montgomerycountymd.gov/swstmpl.asp?url=/content/dep/solidwaste/facilities/gude/index.asp

APPENDIX A – ATTACHMENT 4
REGULATORY CORRESPONDENCE

LANDFILL GAS MONITORING PLAN

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard, Suite 605 • Baltimore MD 21230-1719
410-537-3000 • 1-800-633-6101

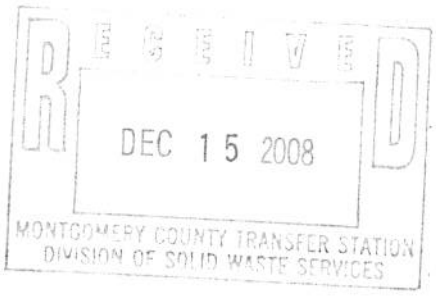
Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

December 12, 2008



CERTIFIED MAIL
Return Receipt Requested

Mr. Peter R. Karasik
Department of Environmental Protection
16101 Frederick Road
Derwood MD 20855

Dear Mr. Karasik:

This is in reference to landfill gas monitoring at the Gude Sanitary Landfill. The Maryland Department of the Environment (the "Department") has reviewed your letter dated November 14, 2008, and requests that you submit a gas monitoring plan for the Gude Landfill within 60 days of receipt of this letter. The monitoring plan should include, at a minimum, quarterly monitoring of probes around the property boundary of the landfill and an assessment of the concentration of methane gas at the property boundary. In accordance with Code of Maryland Regulation 26.04.07.03B(9), the Gude Landfill cannot be operated in such a manner that the concentration of explosive gases generated by the landfill exceeds 25 percent of the lower explosive limits for the gases in facility structures, excluding gas control or recovery system components, and the lower explosive limit for the gases at the property boundary.

The Department appreciates your cooperation in this important matter. If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson

Martha Hynson, Chief
Landfill Operations Division

MH:EC:sm

cc: √Mr. Stephen Lezinski
Mr. Horacio Tablada
Mr. James Wagner

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Isiah Leggett
County Executive

Robert Hoyt
Director

February 10, 2009

Martha W. Hynson, Chief
Landfill Operations Division
Solid Waste Program
Maryland Department of the Environment
1800 Washington Blvd., Suite 605
Baltimore, MD 21230

Dear Ms. Hynson:

As requested in your December 12, 2008 letter, the Montgomery County Department of Environmental Protection (DEP), Division of Solid Waste Services (DSWS) has prepared the enclosed Landfill Gas Monitoring Plan (LFGMP) for the closed Gude Landfill.

Currently there are seven (7) permanent landfill gas monitoring wells along the northwest property boundary at the Gude Landfill, which borders the Derwood Station South residential community. As the LFGMP will describe, DSWS and its Contractor (SCS Engineers) will be initiating a bar punch study along the remainder of the Gude Landfill property boundary within thirty (30) days from submitting the LFGMP to MDE. Following the bar punch study, the monitoring data will be tabulated and forwarded to MDE for review.

Also enclosed for information purposes only (i.e. not part of the LFGMP) is a surface emissions monitoring (SEM) report that was prepared by SCS Engineers to assess any potential fugitive emissions that are being emitted through the soil cap at the Gude Landfill. As the SEM report will describe, there were no exceedence points in methane concentrations greater than 500 parts per million (ppm) above background ambient air conditions as specified in 40 CFR 60.755 (c) and (d) and 40 CFR 60, Appendix A, Method 21.

If you should have any comments or questions regarding the information presented in this package, please contact Stephen Lezinski at 240-777-6590 or myself at 240-777-6569. Thank you.

Sincerely,

Stephen T. Lezinski, Engineer III
Montgomery County DEP
Division of Solid Waste Services

Peter R. Karasik, Section Chief
Montgomery County DEP
Division of Solid Waste Services

STL:PRK/stl/mdegudelfgmp2-10-09.doc

Enclosures

cc: Andrew Grenzer, Lead Geologist, Solid Waste Program, MDE (w/encl.)
Robert Hoyt, Director, DEP
Daniel Locke, Chief, DEP/DSWS
Mike Kalish, Project Manager, SCS Engineers (w/encl.)

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard, Suite 605 • Baltimore MD 21230-1719
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

March 2, 2009

CERTIFIED MAIL
Return Receipt Requested

Mr. Peter R. Karasik
Department of Environmental Protection
16101 Frederick Road
Derwood MD 20855

Dear Mr. Karasik:

This is in reference to the Landfill Gas Monitoring Plan dated February 2009 for the Gude Sanitary Landfill which was received by the Maryland Department of the Environment (the "Department") on February 11, 2009. The Department has reviewed the plan and has the following comments.

- The proposal in Section 3.3 to install bar punches will be sufficient as an initial assessment to determine if methane gas is migrating off site. However, this will not be sufficient to demonstrate that there is no potential for methane to migrate off site and negate the need for permanent gas monitoring wells along the property boundary. The County should proceed with the bar punch study and submit proposed locations of additional gas monitoring wells along the property boundary where there are no surface water barriers. The locations of the additional wells are to be submitted to the Department within 30 days of completing this study.

- Section 3.7 must be changed to state that the monitoring frequency for the gas monitoring wells shall be at least quarterly unless written approval is obtained from the Department to reduce the frequency.

Please submit a revision to the plan based upon the results of the landfill gas study along the Gude Landfill property boundary, which is currently scheduled to be completed by March 10, 2009. The Department appreciates your cooperation in this important matter. If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson, Chief
Landfill Operations Division

RECEIVED
DEP - SOLID WASTE
MAR 04 2009
MONTGOMERY COUNTY
TRANSFER STATION

MH:ATG:sm
cc: Mr. Stephen Lezinski
Mr. Horacio Tablada
Mr. Brian Coblentz

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Isiah Leggett
County Executive

Robert Hoyt
Director

April 2, 2009

Martha W. Hynson, Chief
Landfill Operations Division
Solid Waste Program
Maryland Department of the Environment
1800 Washington Blvd., Suite 605
Baltimore, MD 21230

Dear Ms. Hynson:

As requested in your March 2, 2009 letter, the Montgomery County Department of Environmental Protection (DEP), Division of Solid Waste Services (DSWS) has revised the Landfill Gas Monitoring Plan (LFGMP) for the closed Gude Landfill. The Bar Punch Study was performed and completed on March 3 – 5, 2009. Based on the results of the Bar Punch Study and MDE regulatory requirements, enclosed please find specific Sections of the LFGMP that have been revised from our original February 10, 2009 submittal. These revisions will be considered Amendment No. 1 to the LFGMP:

- LFGMP text with primary revisions to Sections 3.3 and 3.7 – replace in its entirety, and
- Appendix F – replace in its entirety.

Please retain the original Sections that have been replaced for your records. If you should have any comments or questions regarding the information presented in this package, please contact Stephen Lezinski at 240-777-6590 or myself at 240-777-6569. Thank you.

Sincerely,

Stephen T. Lezinski, Engineer III
Montgomery County DEP
Division of Solid Waste Services

Peter R. Karasik, Section Chief
Montgomery County DEP
Division of Solid Waste Services

STL:PRK/stl/mdegudelfgmp amend#1 4-2-09.doc

Enclosures
cc: Andrew Grenzer, Lead Geologist, Solid Waste Program, MDE (w/encl.)
Robert Hoyt, Director, DEP
Daniel Locke, Chief, DEP/DSWS
Mike Kalish, Project Manager, SCS Engineers (w/encl.)
Keith Ligon, GLCC (w/encl.)

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard, Suite 605 • Baltimore MD 21230-1719
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

April 22, 2009

CERTIFIED MAIL
Return Receipt Requested

Mr. Peter R. Karasik
Department of Environmental Protection
16101 Frederick Road
Derwood MD 20855

Dear Mr. Karasik:

This is in reference to the Landfill Gas Monitoring Plan dated February 2009 (amended April 2, 2009) for the Gude Sanitary Landfill, which was received by the Maryland Department of the Environment (the "Department") on April 3, 2009, and the subsequent e-mail correspondence between the Department and Stephen Lezinski on April 15, 2009. The Department has reviewed and hereby approves the plan pursuant to the inclusion of the additional landfill gas monitoring wells as referenced in the email.

Please submit an updated site location map once the proposed landfill gas monitoring wells have been installed. The Department appreciates your cooperation in this important matter. If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson

Martha Hynson, Chief
Landfill Operations Division

MH:ATG:sm

cc: Mr. Stephen Lezinski
Mr. Horacio Tablada
Mr. Brian Coblentz

RECEIVED
DEP - SOLID WASTE
APR 22 2009
MONTGOMERY COUNTY
TRANSFER STATION

APPENDIX A – ATTACHMENT 4
REGULATORY CORRESPONDENCE

GROUNDWATER AND SURFACE WATER MONITORING PLAN

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard, Suite 605 • Baltimore MD 21230-1719
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

January 28, 2009

CERTIFIED MAIL
Return Receipt Requested

Mr. David Lake, Manager
Water and Wastewater Policy Group
Department of Environmental Protection
255 Rockville Pike, Suite 120
Rockville MD 20850

Dear Mr. Lake:

The Maryland Department of the Environment (the "Department") has reviewed the water quality monitoring results which you recently forwarded to us for the Gude Landfill for the period between April 2001 and March 2008. The analytical data indicates that Gude Landfill is having an adverse effect on the surface and groundwater on the site and suggests that the impact may extend beyond the property boundary of the landfill. Montgomery County is directed to monitor and evaluate the potential risks associated with the documented contamination.

The Department requires that you submit a Groundwater and Surface Water Monitoring ("G&SWM") Plan for the Gude Landfill within 60 days of receipt of this letter. The Plan shall be prepared in accordance with COMAR 26.04.07.08B(17), 26.04.07.09F and guidelines established by the Department.

The Plan must contain statements that the following will take place:

1. A semiannual report on water quality containing summary and interpretative discussion of all analyses of the chemical quality of groundwater from all of the monitoring wells and surface water monitoring points specified in the approved G&SWM Plan will be submitted to the Department. The discussion should emphasize historical trends in the data. Also, the report must include statistical analysis methods in evaluating groundwater monitoring data;
2. The semiannual report on water quality will be submitted to the Department within ninety days of the close of every first and third calendar quarters unless an alternative schedule is specified in the approved G&SWM Plan;

3. Sampling will occur during the period between January through March and July through September of each year unless an alternative schedule is approved by the Department;
4. A qualified groundwater scientist will sample or will oversee qualified environmental technicians who sample the wells twice annually at the intervals specified in the approved G&SWM Plan;
5. The parameters to be measured and their Practical Quantitation Limits (PQL) are as listed in Tables I and II (enclosed). The Department may approve an alternative list of parameters or an alternative PQL for any parameter;
6. The sampling, sample handling, analyses and reporting of analytical parameters shall be performed in accordance with the approved G&SWM Plan;
7. A qualified independent laboratory certified for water quality analysis by the Department or which is otherwise acceptable to the Department shall perform the analyses;
8. A qualified groundwater scientist or professional shall evaluate the results and advise the County of any changes in water quality or any exceedance of the State and federal Maximum Contaminant Level (MCL), Action Level or other health standard;
9. A complete copy of the laboratory data, and the qualified groundwater scientist or professional's interpretive findings shall be included in each semiannual report on water quality referenced;
10. If analytical results from samples collected from any sources associated with the landfill or surrounding properties exceed MCL, Action Level, or other health standard for the first time, the County must notify the Department in writing within 24 hours of receipt of the analytical data detecting this occurrence. Thereafter, if there are any significant increases above the MCL, Action Level, or other health standard, the Department must be notified in writing within 24 hours of receipt of the analytical data detecting this occurrence;
11. Upon detection of the exceedance of an MCL, Action Level or other health standard for the first time, the monitoring point(s) in which the standard was exceeded must be immediately resampled to verify the initial detection. This resampling must occur as soon as possible, and no later than 30 days following notification of the County of the exceedance of the standard by the analytical laboratory performing the analysis of the sample which indicated the exceedance;
12. All data for each well must be summarized and presented in time series format. The data for each well must be presented on a chart so that the water quality data for each parameter for each well can be observed simultaneously;

13. All "J" values must be reported. "J" values are analytical results that are below the PQL but can be estimated.
14. A copy of the most current topographic map generated by a survey performed will be included in each semiannual report on water quality and shall depict the location of all monitoring wells, piezometers, surface water monitoring stations and gas monitoring points in existence at the time of the survey.
15. A copy of a current groundwater contour map depicting the location of all monitoring wells from which groundwater data is collected will be included in each semiannual report on water quality. Multiple aquifers shall be depicted on separate groundwater contour maps; and
16. Well completion reports for the monitoring wells will be included in the Plan.

In addition, the Department requires the County determine the nature and extent of contamination in groundwater and surface water and submit a remedial action plan within 90 days of receipt of this letter. The Department would be willing to review a draft of the nature and extent investigation proposal should the County want our comments.

The Department is aware of the pending plans to relocate a County school bus depot on top of the Gude Landfill. Any planned alteration or construction at a solid waste acceptance facility must be submitted to the Department for approval under §9-204 of the Annotated Code of Maryland. Montgomery County has already been notified to submit any plans to construct a bus depot on the Gude Landfill to the Department for review and approval.

If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson

Martha Hynson, Chief
Landfill Operations Division

MH:ATG:sm

Enclosure

cc: Mr. Peter Karasik, P.E.
Mr. Horacio Tablada
Mr. Brian Coblentz

TABLE I
MONITORING PARAMETERS

VOLATILE ORGANIC COMPOUNDS	PQL (ppb)
Acetone	5.0
Acrylonitrile	5.0
Benzene	1.0
Bromochloromethane	1.0
Bromodichloromethane	1.0
Bromoform	1.0
Bromomethane	1.0
2-Butanone	5.0
Carbon disulfide	1.0
Carbon tetrachloride	1.0
Chlorobenzene	1.0
Chloroethane	1.0
Chloroform	1.0
Chloromethane	1.0
Dibromochloromethane	1.0
1,2-Dibromo-3-chloropropane	1.0
1,2 – Dibromoethane (EDB)	1.0
Dibromomethane	1.0
1,2 – Dichlorobenzene	1.0
1,4 – Dichlorobenzene	1.0
Trans-1,4-dichloro-2-butene	5.0
1,1-Dichloroethane	1.0
1,2-Dichloroethane	1.0
1,1-Dichloroethene	1.0
Cis-1,2-Dichloroethene	1.0
Trans-1,2-Dichloroethene	1.0
Methylene chloride	1.0
1,2-Dichloropropane	1.0
Trans-1,3-Dichloropropene	1.0
Cis-1,3-Dichloropropene	1.0
Ethylbenzene	1.0
2-Hexanone	5.0
Iodomethane	1.0
4-Methyl-2-pentanone	5.0
Methyl Tertiary Butyl Ether	2.0
Styrene	1.0
1,1,1,2-Tetrachloroethane	1.0
1,1,2,2-Tetrachloroethane	1.0

TABLE I (Cont'd)
MONITORING PARAMETERS

VOLATILE ORGANIC COMPOUNDS	PQL (ppb)
Tetrachloroethene	1.0
Toluene	1.0
1,1,1-Trichloroethane	1.0
1,1,2-Trichloroethane	1.0
Trichloroethene	1.0
Trichlorofluoromethane	1.0
1,2,3-Trichloropropane	1.0
Vinyl acetate	1.0
Vinyl chloride	1.0
Xylene	1.0

TABLE II
MONITORING PARAMETERS

ELEMENTS AND INDICATOR PARAMETERS	PQL (ppm)
Total Antimony	0.0020
Total Arsenic	0.0020
Total Barium	0.0100
Total Beryllium	0.0020
Total Cadmium	0.0040
Total Chromium	0.0100
Total Calcium	0.08
Total Cobalt	0.0100
Total Copper	0.0100
Total Iron	0.0050
Total Lead	0.0020
Total Nickel	0.0110
Total Magnesium	0.004
Total Manganese	0.0100
Total Mercury	0.0002
Total Potassium	0.39
Total Selenium	0.035
Total Silver	0.0100
Total Sodium	0.2
Total Thallium	0.0020
Total Vanadium	0.0100
Total Zinc	0.0100
PH	0.1 (SU)
Alkalinity	1
Hardness	0.5
Chloride	0.39
Specific conductance	1
Nitrate	0.06
Chemical oxygen demand	10
Turbidity	0.11 (NTU)
Ammonia	1
Sulfate	0.38
Total dissolved solids	10

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Isiah Leggett
County Executive

Robert G. Hoyt
Director

March 27, 2009

Ms. Martha Hynson, Chief
Landfill Operations Division
Maryland Department of the Environment
1800 Washington Boulevard, Suite 605
Baltimore, Maryland 21230-1719

Dear Ms. Hynson:

Please find enclosed the Groundwater and Surface Water Monitoring (G&SWM) Plan for the Gude Landfill as requested in your letter to me dated January 28, 2009. This monitoring plan was developed in accordance with Maryland Department of the Environment (MDE) guidelines provided in your letter and with the requirements set forth in the Code of Maryland Regulations (COMAR) 26.04.07.08B(17) and 26.04.07.09F. The Montgomery County Department of Environmental Protection (DEP) will continue to perform the existing Gude Landfill groundwater and surface monitoring program until such time as we receive final approval of the enclosed G&SWM Plan or unless otherwise directed by your office. Once DEP receives MDE approval of the G&SWM Plan, DEP will adopt the approved Plan for the monitoring of the Gude Landfill and in the development of future reports.

Montgomery County DEP appreciates the assistance and advice provided by your office in the development of the G&SWM Plan, the Landfill Gas Monitoring Plan and in our on-going effort to develop a remediation plan for the Gude Landfill. DEP is developing a cooperative working relationship with the Community near the Gude Landfill that will enable us to efficiently respond to their concerns and communicate the monitoring results and reports from these monitoring plans. As discussed, we will involve the community in the development of the landfill remediation plan. It is our goal to be responsive to both MDE and the community as we investigate and address the impacts of the Gude Landfill in this area of the County.

Please do not hesitate to contact me if you have any comments or questions on the enclosed G&SWM Plan. I can be contacted at 240-777-7733 or at dave.lake@montgomerycountymd.gov.

Sincerely,

David W. Lake, Manager
Water and Wastewater Policy Group

Enclosure
cc: Andrew Grenzer, MDE (w/encl.)
Robert Hoyt, DEP
Nasser Kamazani, DEP
Peter Karasik, DSWS
Stephen Lezinski, DSWS (w/encl.)

MDE
MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

May 11, 2009

CERTIFIED MAIL
Return Receipt Requested

Mr. Peter R. Karasik
Department of Environmental Protection
16101 Frederick Road
Derwood MD 20855

Dear Mr. Karasik:

This is in reference to the Landfill Groundwater and Surface Water Monitoring Plan dated March 2009 for the Gude Sanitary Landfill, which was received by the Maryland Department of the Environment (the "Department") on March 31, 2009. The Department has reviewed and hereby approves the plan pursuant to the inclusion of turbidity to the field parameter list in Attachment D, Monitoring Parameters.

The Department appreciates your cooperation in this important matter. If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson

Martha Hynson, Chief
Landfill Operations Division

MH:ATG:sm

cc: Mr. Stephen Lezinski
Mr. Horacio Tablada
Mr. Brian Coblentz

APPENDIX A – ATTACHMENT 4
REGULATORY CORRESPONDENCE

REMEDIATION APPROACH

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard, Suite 605 • Baltimore MD 21230-1719
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Summers, Ph.D.
Secretary

January 28, 2009

CERTIFIED MAIL
Return Receipt Requested

Mr. David Lake, Manager
Water and Wastewater Policy Group
Department of Environmental Protection
255 Rockville Pike, Suite 120
Rockville MD 20850

* See Page 3 *

Dear Mr. Lake:

The Maryland Department of the Environment (the "Department") has reviewed the water quality monitoring results which you recently forwarded to us for the Gude Landfill for the period between April 2001 and March 2008. The analytical data indicates that Gude Landfill is having an adverse effect on the surface and groundwater on the site and suggests that the impact may extend beyond the property boundary of the landfill. Montgomery County is directed to monitor and evaluate the potential risks associated with the documented contamination.

The Department requires that you submit a Groundwater and Surface Water Monitoring ("G&SWM") Plan for the Gude Landfill within 60 days of receipt of this letter. The Plan shall be prepared in accordance with COMAR 26.04.07.08B(17), 26.04.07.09F and guidelines established by the Department.

The Plan must contain statements that the following will take place:

1. A semiannual report on water quality containing summary and interpretative discussion of all analyses of the chemical quality of groundwater from all of the monitoring wells and surface water monitoring points specified in the approved G&SWM Plan will be submitted to the Department. The discussion should emphasize historical trends in the data. Also, the report must include statistical analysis methods in evaluating groundwater monitoring data;
2. The semiannual report on water quality will be submitted to the Department within ninety days of the close of every first and third calendar quarters unless an alternative schedule is specified in the approved G&SWM Plan;

3. Sampling will occur during the period between January through March and July through September of each year unless an alternative schedule is approved by the Department;
4. A qualified groundwater scientist will sample or will oversee qualified environmental technicians who sample the wells twice annually at the intervals specified in the approved G&SWM Plan;
5. The parameters to be measured and their Practical Quantitation Limits (PQL) are as listed in Tables I and II (enclosed). The Department may approve an alternative list of parameters or an alternative PQL for any parameter;
6. The sampling, sample handling, analyses and reporting of analytical parameters shall be performed in accordance with the approved G&SWM Plan;
7. A qualified independent laboratory certified for water quality analysis by the Department or which is otherwise acceptable to the Department shall perform the analyses;
8. A qualified groundwater scientist or professional shall evaluate the results and advise the County of any changes in water quality or any exceedance of the State and federal Maximum Contaminant Level (MCL), Action Level or other health standard;
9. A complete copy of the laboratory data, and the qualified groundwater scientist or professional's interpretive findings shall be included in each semiannual report on water quality referenced;
10. If analytical results from samples collected from any sources associated with the landfill or surrounding properties exceed MCL, Action Level, or other health standard for the first time, the County must notify the Department in writing within 24 hours of receipt of the analytical data detecting this occurrence. Thereafter, if there are any significant increases above the MCL, Action Level, or other health standard, the Department must be notified in writing within 24 hours of receipt of the analytical data detecting this occurrence;
11. Upon detection of the exceedance of an MCL, Action Level or other health standard for the first time, the monitoring point(s) in which the standard was exceeded must be immediately resampled to verify the initial detection. This resampling must occur as soon as possible, and no later than 30 days following notification of the County of the exceedance of the standard by the analytical laboratory performing the analysis of the sample which indicated the exceedance;
12. All data for each well must be summarized and presented in time series format. The data for each well must be presented on a chart so that the water quality data for each parameter for each well can be observed simultaneously;

13. All "J" values must be reported. "J" values are analytical results that are below the PQL but can be estimated.
14. A copy of the most current topographic map generated by a survey performed will be included in each semiannual report on water quality and shall depict the location of all monitoring wells, piezometers, surface water monitoring stations and gas monitoring points in existence at the time of the survey.
15. A copy of a current groundwater contour map depicting the location of all monitoring wells from which groundwater data is collected will be included in each semiannual report on water quality. Multiple aquifers shall be depicted on separate groundwater contour maps; and
16. Well completion reports for the monitoring wells will be included in the Plan.

In addition, the Department requires the County determine the nature and extent of contamination in groundwater and surface water and submit a remedial action plan within 90 days of receipt of this letter. The Department would be willing to review a draft of the nature and extent investigation proposal should the County want our comments.

The Department is aware of the pending plans to relocate a County school bus depot on top of the Gude Landfill. Any planned alteration or construction at a solid waste acceptance facility must be submitted to the Department for approval under §9-204 of the Annotated Code of Maryland. Montgomery County has already been notified to submit any plans to construct a bus depot on the Gude Landfill to the Department for review and approval.

If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson

Martha Hynson, Chief
Landfill Operations Division

MH:ATG:sm

Enclosure

cc: Mr. Peter Karasik, P.E.
Mr. Horacio Tablada
Mr. Brian Coblentz

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Isiah Leggett
County Executive

Robert Hoyt
Director

April 29, 2009

Martha Hynson, Chief
Landfill Operations Division
Solid Waste Program
Maryland Department of the Environment
1800 Washington Blvd., Suite 605
Baltimore, MD 21230-1719

Re: Gude Landfill – Remediation Approach

Dear Ms. Hynson:

In accordance with your letter dated January 28, 2009 to Mr. David Lake and our February 26, 2009 meeting, the Montgomery County Department of Environmental Protection (DEP), Division of Solid Waste Services (DSWS) is providing our formal approach to remediation at the Gude Landfill for review and approval. This remediation approach complies with the 90 day submission deadline (i.e. April 30, 2009) from receipt of the January 28, 2009 letter. The initial phase of the remediation approach will include Field Survey, Waste Delineation, and a Nature and Extent Study to assess any potential adverse environmental effects from the low level groundwater contamination at the site and other potential environmental releases to surface water and the atmosphere. The Gude Landfill is located at 600 E. Gude Drive in Rockville, Maryland.

Provided below is our remediation approach, which is divided into several subheadings: Project Sequence and Schedule, Technical Support, Project Funding, and Coordination with the Maryland Department of the Environment (MDE), Community and Other Jurisdictional and Public Agencies. We have also provided a subheading to reference recent regulatory compliance submissions and post-closure care maintenance activities.

Project Sequence and Schedule

The principal phases of the Gude Landfill remediation approach are outlined below, including a preliminary schedule for implementation and completion:

Phases of Work for Remediation	Preliminary Schedule	Duration
0. Survey and Limit of Waste Delineation	May 2009 – July 2009	3 Months
I. Nature and Extent Study	June 2009 – November 2009	6 Months
II. Remediation Alternatives Investigation and Preparation of Formal Remediation Plan [1]	December 2009 – May 2010	6 Months
III. Prepare Design, Permitting, and Construction Bid Documents for Selected Remediation Alternative(s). This work may be phased [1]	June 2010 – August 2011	15 Months
IV. Construction of Stage I Remediation Work [2]	September 2011 – August 2012	12 Months
V. Construction of Stage II Remediation Work [2]	September 2012 – August 2013	12 Months
VI. Construction of additional Stages of Remediation Work and Site Reuse Options [2]	Schedules to be determined	---

1) Schedule may be affected by budget review and approval process, permitting reviews and approvals, public coordination efforts, and other unforeseen public obligations. Actual durations may be shorter or longer depending on such factors.
2) While the specific remediation work and site reuse options are not defined yet, this schedule recognizes a phased implementation with respect to professional services, funding and construction that will be updated after review of the remediation work with MDE.

Document review and comment time for MDE, Community, and other applicable Jurisdictional and Public Agencies is incorporated into the remediation approach schedule. A formal remediation plan for implementation will be developed and submitted to the MDE following the Nature and Extent Study (Phase I) and the Remediation Alternatives Investigation (Phase II).

Technical Support

DEP/DSWS has an Intergovernmental Agreement (IGA) in place with the Northeast Maryland Waste Disposal Authority (Authority) to provide "technical, engineering, operations, procurement and marketing assistance to the County with respect to the County's Solid Waste Management System and in furtherance of the County's solid waste activities." The Authority has several pre-qualified firms under contract with expertise in hydrogeology, surveying, landfill design, permitting, construction, closure and remediation. DEP/DSWS and the Authority are in the process of securing a specific proposal and cost from EA Engineering, Science, and Technology (EA Engineering) to take the principal role in the Nature and Extent Study and the identification of remediation alternatives. The County has divided the initial assessment into two initial work phases that will overlap: Aerial Survey, Field Survey, and Limits of Waste Delineation; and the full Nature and Extent Study. Copies of the Scope of Work for each work segment are enclosed as Attachments 1 and 2 to this letter.

DEP/DSWS also has SCS Engineers under contract for landfill gas monitoring and collection system maintenance services, including operation and maintenance of the existing enclosed Flare Station. SCS Engineers is also currently in the construction phase for the Landfill Gas-to-Energy Facility at the Gude Landfill, which previously received a permit-to-construct by the MDE Air and Radiation Management Administration (ARMA) on September 5, 2008. In addition, as noted in the Landfill Gas Monitoring Plan (LFGMP), upon official approval of the

plan by MDE (received April 22, 2009), SCS Engineers will be authorized to initiate design and installation of 24 new landfill gas monitoring wells along the landfill perimeter property boundary. The existing contractual arrangements with the Authority and SCS Engineers will allow DEP/DSWS to initiate the respective activities of the Nature and Extent Study and the landfill gas monitoring well work without delay.

Project Funding

With respect to financial commitments, DEP/DSWS has already reallocated $1.3 million dollars of FY09 funds to cover costs associated with the Survey and Waste Delineation, Nature and Extent Study, and the Remediation Alternatives Investigation. Approximately $200,000 of FY09 funds have also been allocated for use under an existing contract with SCS Engineers for the installation of the 24 new landfill gas monitoring wells along sections of the landfill perimeter property boundary not already served by existing landfill gas monitoring wells. DEP/DSWS will be working with the staff of the County Executive and County Council to develop a Capital Improvement Program (CIP) Project Description Form (PDF) to plan the resources required for the remediation of the Gude Landfill. This will happen later in FY10, after the Nature and Extent Study has been completed and a remediation alternative selected, so we can better estimate the cost and duration of the project. The PDF will include a funding schedule that presents capital and maintenance costs over the subsequent six (6) years.

Coordination with MDE, Community and Other Jurisdictional and Public Agencies

DEP/DSWS is currently working closely with MDE on site inspections, repairs, and the development and approval of formal plans for Landfill Gas Monitoring (approved April 22, 2009) and Groundwater and Surface Water Monitoring (currently under review by MDE). DEP/DSWS will continue to work closely with MDE to create a baseline schedule to outline submission requirements for other potential plans, documentation, and timelines for work related to the remediation approach.

DEP/DSWS is maintaining regular communications with the Gude Landfill Concerned Citizens (GLCC) group and is incorporating funds for public presentations and meetings in upcoming contract work for the Nature and Extent Study. DEP/DSWS will also coordinate the development of the formal remediation plan, to be provided in greater detail after the Nature and Extent Study is completed, with the Maryland-National Capital Park and Planning Commission (M-NCPPC). This will be incorporated into the Mandatory Referral process, including the consideration of potential future site uses with the remediation plans. The County Executive and County Council will also play an integral role in proposing future uses for the site and seeking public input through public hearings on the CIP project and other forums.

Regulatory Compliance Submissions and Post-Closure Care Maintenance Activities

A summary description of recent MDE regulatory compliance submissions and site maintenance activities for the Gude Landfill are provided in Attachment 3. DSWS will continue to perform best management practices for post-closure care at the Gude Landfill during the

remediation project for: stormwater management, landfill gas management, erosion and sedimentation control, leachate seep correction, and good house-keeping.

Please contact me at 240-777-6569, or at peter.karasik@montgomerycountymd.gov if you have questions or comments concerning this letter.

Sincerely,

Peter R Karasik

Peter R. Karasik, P.E.
Section Chief, DEP/DSWS Central Operations

PRK:pk/gudelf_remediation_approach (4-29-09).doc

Enclosures

cc: Karen Kumm Morris, Maryland-National Capital Park and Planning Commission
Keith Ligon, Gude Landfill Concerned Citizens
Robert Hoyt, Director, Department of Environmental Protection
Daniel Locke, Chief, DEP/DSWS
David Lake, Special Assistant/Office of the Director, DEP
Stephen Lezinski, Engineer III, DEP/DSWS

ATTACHMENT 1

SCOPE OF WORK
FOR
AERIAL SURVEY, FIELD SURVEY AND LIMIT OF WASTE DELINEATION
AT THE GUDE LANDFILL

EA will subcontract and manage an aerial survey/mapping firm and a professional land surveying firm to provide the services detailed in this scope of work. Applied Mapping Solutions will coordinate the aerial photography and provide mapping services. J.A. Rice will perform property research and field surveying, including setting targets for the aerial photogrammetry, a metes and bounds survey, and surveying site features that aerial photogrammetry cannot capture.

For the survey, the horizontal datum will be NAD 83, the vertical datum will be NAVD 88, and the coordinate system will be Maryland State Plane (feet).

Task 1 – Aerial Photography and Mapping

Task 1 will begin as soon as Notice-to-Proceed is issued so the aerial photography can be taken as soon as possible. The aerial photography is most effective when there is no foliage on the trees. Specific scope items include:

- Establish targets and ground controls needed for the aerial survey within one week of NTP. Provide graphical representation of area for aerial survey for approval by county before flyover (showing the limit of mapping).
- Perform aerial photography of Gude Landfill at an approximate photo scale of 1"=450', using high resolution, high precision, photogrammetric aerial camera. The photography will cover the area shown in blue in the attached figure, "Gude Landfill Control."
- Provide geo-referenced, color TIF of site at 1-ft pixel resolution. Provide 2 CD-ROMs of the electronic photo for review before any hardcopies are provided.
- Provide 2, 36" x 48" aerial photos mounted on gator board and PDFs of photos, based on the coverage requested by the County after review of the electronic photos. Photos to be geo-referenced.
- Map site physical and topographic features, including:
    - 1"=100' mapping with 2-ft contours within site and to 500-foot limit beyond property boundary
    - Visible and identifiable features to be collected include:
        1. Buildings and other structures (including fence and building corners of the enclosed stack flare station and former power plant building.
        2. Fence lines.
        3. Tanks and major pieces of stationary equipment.
        4. Utility poles and visible utilities (manholes, etc.).
        5. Stockpiles.
        6. Edge of roads, trails, paved areas, and gravel areas.
        7. Grade breaks/tops and bottoms of slopes and mass points to support generation of contours at 2' intervals, to meet National Map Accuracy Standards.
        8. Roadways and rail lines.

9. Above-ground landfill gas extraction system piping.
10. Tree lines and significant vegetation.
11. Edge of streams and other water.
12. Other major site features.
13. Areas obscured by vegetation, shadow, or other features will be identified, but may not meet accuracy requirements and will be field-checked as needed under Task 2.

- Provide 3 draft prints of mapping to the County for review.
- Provide 5 final prints and 2 final mylars and PDFs of survey to the County. Provide 2 CD-ROMs of electronic files in AutoCAD R14 compatible format to the County.
- Provide all proofs to the County once the photography and mapping is approved.

Task 2 – Field Surveying

Task 2 will commence after Notice-to-Proceed is issued and ground controls are set for Task 1. Specific scope items include:

- Perform property research and prepare a property mosaic or compilation showing the Gude Landfill and surrounding property owners within a ½-mile radius of the site.
- Perform a metes and bounds survey of the Gude Landfill and recover or re-establish property corners. Place permanent monuments (brass plates on concrete showing elevation and northing and easting coordinates) at the property corners and steel pipe markers approximately every 500 feet along other segments of the property line as-needed to provide line-of-site from one monument to the next.
- Survey limit of waste on the County property delineation flags, stakes, or other field markers placed by others as coordinated by EA Engineering (assume 1 month in the field with combination of hand auger and excavator).
- With the County's direction, mark the potential outline of the yard trim processing area.
- Field survey site features that will not be captured on an aerial survey, but captured during the field survey include:
  - Topography of open drainage features including benches, swales, downchutes, and ponds.
  - Horizontal location and inverts of culverts, storm drains, and pond risers.
  - Horizontal location, top of casing elevation, and ground surface elevation of existing landfill gas and groundwater monitoring wells.
  - Horizontal location and ground surface elevation of existing gas extraction wells.
  - Horizontal location and elevation of landfill gas header pipe junctions.
  - Topography and survey of site features in areas obscured from aerial photography.

- Survey the entire landfill property boundary and other areas of the site including the exterior of the landfill gas enclosed stack flare station and former power plant building with a certified utility locator for a period of one (1) week.

Task 3 – EA Coordination

Task 3 will include one (1) month or twenty (20) days of a staff member's field time for EA Engineering to coordinate, observe, and document the limits of waste investigation as well as any office time to overlay the results on a site map. EA shall perform testing pitting with heavy equipment or via hand excavation. Equipment is to be rented for a one (1) month period. EA Engineering 's staff time to coordinate and manage Tasks 1 and 2 shall be listed under Task 3 in separate line items in the cost proposal.

ATTACHMENT 2

SCOPE OF WORK
FOR THE
NATURE AND EXTENT STUDY
AT THE GUDE LANDFILL

I. Nature and Extent Study

A. Collect, review and analyze groundwater and surface water monitoring and laboratory testing data, as provided by the County, including any County trend analyses and well boring construction completion logs.

B. Field review and evaluate available information related to the existing groundwater monitoring wells. Inspect the groundwater monitoring wells to determine current physical condition and assess the need for any potential maintenance including: well casing, well screen, potential for sedimentation occurring at the well screen, etc. Also evaluate the current number of groundwater monitoring wells and their placement with respect to acquiring usable and application data for background conditions and regulatory compliance.

C. Field review, sample (as necessary), and evaluate existing conditions of surface water bodies that border the Gude Landfill property boundary.

D. Field review, sample (as necessary) and evaluate any known, visible or suspect areas on the landfill and along the perimeter property boundary for leachate seeps. Provide recommendations for immediate and long-term corrective measures.

E. Perform a wetland delineation and forest stand delineation and survey wetland and forest boundaries that are contained within and border the Gude Landfill property for presentation on separate site maps. Obtain a jurisdictional determination for the wetland boundaries to support the Clean Water Act Section 404 permitting. Forest stand delineation must meet the requirements of the Maryland-National Capital Park and Planning Commission.

F. Plan and field review of site stormwater management infrastructure including: stormwater drainage flow, swales, stormwater control structures, and associated design and available as-built drawings for previous site improvements.

G. Review existing landfill gas monitoring data and boring construction logs in regards to regulatory compliance and future placement of new permanent perimeter landfill gas monitoring wells (by others) Provide surveyed property boundary documentation to the County Landfill Gas Management Contractor for installation of the new permanent perimeter landfill gas monitoring wells.

H. Plan and field review of site topography and topographic maps.

I. Determine additional data needs to evaluate existing conditions and prepare a comprehensive Nature and Extent Study Work Plan for submission to the County and the Maryland Department of the Environment (MDE) for review and concurrence.

J. Prepare a site specific Health and Safety Plan for field work at the Gude Landfill.

K. Perform additional field work with own staff or subcontractors as required to fill in data gaps for existing conditions including, but not limited to groundwater, surface water, landfill gas and stormwater management monitoring and infrastructure to prepare a comprehensive Nature and Extent Study.

L. Develop separate and independent contour maps presenting groundwater contours and surface water and stormwater flow directions on and around the perimeter of the landfill property. Develop an existing conditions drainage area map for the Gude Landfill.

M. In conjunction with the independent groundwater contour maps and surface water and stormwater flow direction maps, provide a separate map depicting likely contaminant migration routes, identify human exposure pathways, and assess the potential for human exposure along the migration routes.

N. Perform additional statistical analyses, limited computer-aided modeling or other measures to assess groundwater, surface water, and landfill gas contaminant concentration over time, mobility, impact to environment, etc.

O. Contact and provide written documentation for correspondence with applicable federal, state, and local permitting agencies, other jurisdictional entities, and adjacent property owners to inquire about potential permitting requirements, public public notification requirements, and property access for general remediation actions at the Gude Landfill. Agencies are to include, but are not limited to:

    1. MDE – nature and extent, etc.
    2. Army Corps of Engineers – wetlands, streams, etc.
    3. Maryland-National Capital Parks and Planning Commission (M-NCPPC) – land use, forest conservation (NRI/FSD), mandatory referral, etc.
    4. County Department of Permitting Services (DPS) – stormwater management, sediment control, etc.
    5. Columbia Gas/Trans Continental – gas line right-of-way, etc.

P. Following the review of existing and new information, provide a breakdown of the Gude Landfill site into priority areas for remediation based on potential pathways for human exposure (perceived risk versus actual risk), environmental impacts, contaminant concentrations, etc. Also consider in the priority evaluation potential recommendations and timelines to implement any immediate corrective measures.

Q. Attend weekly internal planning and progress meetings with County staff.

R. Attend monthly public meeting and presentations, exclusive of internal progress meetings with County staff.

S. Attend necessary meetings with federal, state and local permitting agencies and other jurisdictional entities to meet the objectives of Item O and to complete applicable permitting and public notification requirements.

T. Provide content for a County managed website to keep the public, MDE, and other stakeholders informed of the progress of the project.

U. Prepare a detailed project schedule outlining major work items in M.S. Project format for the Nature and Extent study to be updated on a monthly basis and periodically upon request by the County.

V. Prepare an Executive Summary of the Nature and Extent Study discussing major findings and recommendations, environmental impacts, health and safety concerns, etc.

W. Based on the findings of the Nature and Extent Study, prepare a Remediation Feasibility Memorandum identifying critical items to be considered and incorporated in the next phase of work, Phase 2 – Remediation Alternatives Investigation. Such topics should include, but not be limited to potential remediation options, potential pros and cons to each remediation alternative, and approximate cost ranges. This document will supplement the Executive Summary.

X. Prepare two (2) Nature and Extent Study reports; a status report at 50% completion describing work completed, preliminary results, planned work, and a draft 90% completion stage written report for County review. Ten (10) copies in 3-D-ring binders of the draft report are to be provided.

Y. Prepare one (1) final Nature and Extent Study report for submission to MDE. Fifteen (15) copies in 3-D-ring binders of the final report are to be provided. The Consultant will be responsible for addressing all MDE and other agency comments and any required resubmissions of the Nature and Extent Study.

Z. The duration of this Project Phase will be determined after review of the County's existing data during detailed scoping of the project, which is anticipated to be approximately six (6) months, The project phase duration may be modified based on the review of existing information or performance of site investigations. The Consultant shall provide a project schedule with the proposal to perform the work.

Note – the Consultant shall provide an initial cost estimate for performing the Nature and Extent Study. Costs for all other future phases of work shall be negotiated based on the prior phase's findings and recommendations.

Scope of Work Items Removed for inclusion in Aerial Survey, Field Survey, and Limit of Waste Delineation.

- Conduct new aerial flyover and field surveying to generate an accurate topographic map with 2-foot contours.
- Perform a property deed review for the Gude Landfill, survey property corners, and recover or place permanent surveyed benchmarks along all property corners and points required for line-of-sight between benchmarks.
- Perform test pitting (preferred), hand excavation, or a geophysical survey to delineate the limits of waste along the perimeter landfill property boundary.

ATTACHMENT 3

REGULATORY COMPLIANCE SUBMISSIONS
AND
POST-CLOSURE CARE MAINTENANCE ACTIVITIES
AT THE GUDE LANDFILL

A summary description of recent MDE regulatory compliance submissions and site maintenance activities are provided below for the Gude Landfill:

- Stormwater Compliance at Outfall 006 – During a January 23, 2009 site inspection, MDE and DSWS representatives identified a potentially non-compliant stormwater discharge located along the southeast property boundary of the Gude Landfill. Specifically, the location was at the HDPE Manhole that collects stormwater and discharges to Outfall 006. Outfall 006 discharges to Southlawn Branch Stream. The potentially non-compliant stormwater discharge was documented in an inspection report by MDE and provided to DSWS. DSWS submitted a corrective action work plan to MDE via email on February 2, 2009 to investigate and correct the potentially non-compliant stormwater discharge as well as perform stormwater and surface water sampling and laboratory testing.

  The sampling was conducted on February 2, 2009. The sampling results were received on March 11 and indicated several exceedences (chlorides, iron, and manganese) for only secondary maximum contaminant levels (MCLs), which are not considered compliance violations. The corrective action work plan was implemented and completed during February 24-25, 2009. Weekly inspections were performed during February and March to document existing conditions at Outfall 006, which were recorded and provided to MDE in a March 12, 2009 letter along with the sampling results and corrective actions.

  During the March 27, 2009 site inspection, the DSWS representative documented flow entering the HDPE Manhole through the previously capped 4-inch drain line penetration. On April 9, 2009 this area adjacent to the HDPE Manhole was hand-excavated. The PVC cap on the 4-inch drain line was found to be cracked, thus allowing subsurface drainage to enter the Manhole. Each end of the 4-inch drain line and penetration through the HDPE Manhole were filled with concrete and capped. Following capping, the outer 4-inch drain line extension was encased with concrete to provide a permanent seal. The HDPE Manhole was also cleared of all vegetative debris. In an April 15, 2009 site visit, MDE observed the corrective measures and noted in an April 17, 2009 email that no further corrective action at Outfall 006 is needed at this time. EA Engineering may perform additional sampling as necessary at this location for the Nature and Extent Study. Site inspections at Outfall continued through the remainder of March – April. DSWS provided a summary report to MDE on April 23, 2009.

- Landfill Gas Monitoring Plan – A DSWS Contractor (SCS Engineers) performed a Surface Fugitive Emissions Scan on December 2-3, 2008. DSWS received a letter from MDE dated December 12, 2008 requiring the submission of a formal plan for monitoring landfill gas along the Gude Landfill property boundary. DSWS submitted the Landfill Gas Monitoring Plan (LFGMP) to MDE on February 10, 2009. The LFGMP was developed in accordance with MDE requirements and Code of Maryland Regulations (COMAR) – 26.04.07.03B(9). DSWS received MDE comments on the LFGMP in a letter dated March 2, 2009. A DSWS Contractor (SCS Engineers) performed a Bar Punch

Study on March 3-5, 2009 and submitted Amendment No. 1 to the LFGMP on April 2, 2009 to comply with MDE comments on the Plan. DSWS received one final comment from MDE via email on the LFGMP on April 15, 2009 regarding the placement of three (3) additional landfill gas monitoring wells. DSWS transmitted the required documentation to MDE via email on April 15 (considered to be Amendment No. 2 to the LFGMP). DSWS received official approval of the LFGMP from MDE on April 22, 2009.

- Groundwater and Surface Water Monitoring Plan – DEP received a letter from MDE dated January 28, 2009 requiring the submission of a formal plan for groundwater and surface water monitoring at the Gude Landfill. DEP submitted the Groundwater and Surface Water Monitoring (G&SWM) Plan to MDE on March 27, 2009. DEP is awaiting MDE's comments and concurrence with this Plan. The G&SWM Plan was developed in accordance with MDE requirements and COMAR – 26.04.07.08B (17) and 26.04.07.09F.

  The G&SWM Plan incorporates all of the chemical substances recommended in the January 28, 2009 letter from MDE as provided in Tables 1 and 2. The existing groundwater and surface water monitoring program currently implemented by DEP for that past 20 + years has a more comprehensive list of chemical substances (e.g. pesticides) that have been analyzed for over the years, but have not been detected. The new G&SWM Plan would allow DEP to remove these other substances from the monitoring requirements and laboratory testing. The new G&SWM Plan will also require re-sampling to verify any indication of new or significantly increased MCLs, action levels, or other health standard exceedences, as well as notification to MDE. Semi-annual reporting of all monitoring results to MDE is also a new requirement.

- Post-Closure Care Maintenance Activities – During a February 12, 2009 site inspection, MDE and DSWS representatives identified two leachate seeps: one located on the northwest slope (Leachate Seep #1) and one located on the southeast slope (Leachate Seep #2) of the Gude Landfill. The leachate seeps were documented in an inspection report by MDE and provided to DSWS. In accordance with MDE timelines for corrective action, the repairs to the leachate seeps were performed during February 16-20, 2009.

  DSWS received a letter from MDE dated February 24, 2009 requesting that DSWS immediately repair any active or reoccurring leachate seeps at the Gude Landfill. An area holding ponded stormwater was also regraded during the same time period as the leachate seep repairs on the northwest slope. A summary of the above referenced leachate seeps and site grading repairs were transmitted to Mr. Edward Dexter of MDE in a March 5, 2009 letter from DSWS.

MDE re-inspected Leachate Seep #1 on March 27, 2009 following a recent rain event that occurred on the previous day. The area encompassing Leachate Seep #1 was damp and there were minor expressions of leachate below the erosion control matting. Vegetative cover was just beginning to grow as the original repairs were performed approximately one month prior. DSWS provided a written response to MDE in an email dated April 2, 2009 to address the re-seeping at this location on the northwest slope. The area encompassing Leachate Seep #2 was also re-inspected on March 27 and was noted to be damp with vegetation cover starting to grow. There was no evidence of leachate seepage in this area.

MDE and DSWS met on-site on April 15, 2009 to review alternative corrective actions for Leachate Seep #1. During the site visit, MDE observed damp conditions and minor expressions of leachate at this location following recent rain events; however, there was no evidence of leachate migrating beyond the landfill property. DSWS will initiate site grading improvements to improve surface stormwater drainage off of the landfill soil cap to reduce the potential for infiltration. DSWS will also continue to monitor existing conditions at Leachate Seep #1 to observe if the regrading activities eliminate the leachate seep. If existing conditions worsen at Leachate Seep #1, DSWS shall coordinate with MDE to review and implement further alternative corrective measures.

During the April 15, 2009 site visit, MDE observed no evidence of leachate seepage in the area encompassing the stormwater site regrading repairs; however, EA Engineering may perform additional investigations with respect to potential leachate impacts for the Nature and Extent Study. Also during the April 15 site visit, MDE also observed the non-vegetated area along the gas line right-of-way near Crabbs Branch Stream. There was no evidence of leachate seeping at this location; however, EA Engineering may perform additional investigations of the area with respect to potential leachate impacts and stream sampling for the Nature and Extent Study. There was evidence of tire rutting in this area, which has allowed minor amounts of stormwater to collect in the vicinity.

DSWS will continue to perform best management practices for post-closure care at the Gude Landfill during the Remediation Project for: stormwater management, landfill gas management, erosion and sedimentation control, leachate seep corrections, and good house-keeping.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard • Baltimore MD 21230
410-537-3000 • 1-800-633-6101

Martin O'Malley
Governor

Anthony G. Brown
Lieutenant Governor

Shari T. Wilson
Secretary

Robert M. Summers, Ph.D.
Deputy Secretary

May 27, 2009

CERTIFIED MAIL
Return Receipt Requested

Mr. Peter R. Karasik
Department of Environmental Protection
16101 Frederick Road
Derwood MD 20855

Dear Mr. Karasik:

This is in reference to the Gude Landfill - Remediation Approach Project Sequence and Schedule dated April 2009 for the Gude Sanitary Landfill, which was received by the Maryland Department of the Environment (the "Department") on April 29, 2009. The Department has reviewed and hereby approves the project sequence and schedule.

Per the submittal, the Department approves the scope of work for the survey and limit of waste delineation and the scope of work for the nature and extent study. Enclosed please find a letter from the Gude Landfill Concerned Citizens with comments on the County's proposed work plan and remediation approach. The Department is forwarding this letter to you to insure that community concerns are addressed as appropriate. Please provide a copy of the 50% status report for the nature and extent study when available for Departmental review.

The Department appreciates your cooperation in this important matter. If there are any questions regarding this matter, please contact Mr. Andrew Grenzer, Project Manager, at (410) 537-3318.

Sincerely,

Martha Hynson

Martha Hynson, Chief
Landfill Operations Division

MH:ATG:sm
Enclosure
cc: Mr. Stephen Lezinski
Mr. Horacio Tablada
Mr. Brian Coblentz

RECEIVED
DEP - SOLID WASTE
MAY 28 2009
MONTGOMERY COUNTY
TRANSFER STATION

Gude Landfill Concerned Citizens

15461 Indianola Drive
Derwood, MD 20855

May 19, 2009

Martha Hynson, Chief
Landfill Operations Division
Solid Waste Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 605
Baltimore, MD 21230-1719

Dear Ms. Hynson:

On April 29th the Montgomery County Department of Environmental Protection (DEP) submitted its proposed statement of work for the Nature and Extent Study and proposed Remediation Approach timeline for the Gude Landfill. By copy of that letter, the Gude Landfill Concerned Citizens (GLCC) was invited to comment on the plans and approach. The GLCC offers these comments and recommendations:

Task 2 – Field Survey

We recommend deleting the task (4th bullet) to mark the potential outline of the yard trim processing area. This has absolutely nothing to do with the approach to remediation and appears to be another attempt to avoid MDE direction to not proceed with any aspect of the Yard Trim Project until it has been completely presented to and approved by MDE.

Our community has voiced a clear and resounding objection to any relocation of the commercial wood processing activities to the Gude Landfill site. This Yard Trim site will receive thousands of 18 wheeler trucks and host multiple operations of wood processing equipment such as loaders and tub grinders. The expected wood waste storm water runoff will degrade an already compromised Rock Creek stream. In addition the added weight and vibration of the operating equipment will adversely impact the fragile hydrologic system under the landfill and result in increased contaminate migration.

SOW – Nature and Extent Study

In section C, we recommend that the evaluation include the public marshland 200 yards west-north-west of the Gude Landfill. While not on the landfill border, this area is downhill and collects a lot of landfill storm water runoff. There are also a number of springs in and around the marsh where the first aquifer surfaces.

In section P, we recommend that the exposure evaluation include the potential break though of the contaminated plume into Rock Creek and the inclusion of the human pathway vector on the entire Rock Creek watershed and the subsequent downstream impacts to the downstream freshwater water intakes. This evaluation should also include the potential impact to the Chesapeake Bay Clean Water plan.

We believe that this plan must acknowledge that there could be human exposure pathways. Not a single heavy metal will evaporate and except during the hottest months in the summer, only minimal VOC's will evaporate, but not before affecting water quality and increasing the bioaccumulation of contaminants. Despite the testimony of a Montgomery County official, the GLCC does not believe that dilution is the solution to the Gude Landfill contamination.

Post Closure Maintenance Activities

We are concerned about Leachate Seep #1 and the DEP statement that there is no evidence of leachate migrating beyond the landfill property. A slope failure or seepage due to the fact that the cap has eroded is a condition that needs to be repaired. Seeping within limits or seeping only on landfill property is not an acceptable environmental solution. To ensure the safety of our neighborhood, we recommend that DEP conduct a single full spectrum water sampling of all seeps/springs within 500 yards of the landfill bounds. Additionally, we recommend an analysis of the landfill contaminate impact, both present and potential, on the Total Maximum Daily Load (TMDL) for the Rock Creek stream segment.

Summary

We appreciate all the efforts that have gone into the preparation of this Remediation Approach, particularly the specific tasks to reach out to the community with public meetings and an information sharing website. The GLCC and our entire community are committed to working with DEP and MDE to ensure a safe and hazard free neighborhood environment.

Sincerely,
Keith Ligon,
GLCC Chairman

cc:
Horatio Tablada, Director Waste Management Administration, MDE
Karen Kumm Morris, MNPPC
Robert Hoyt, Director DEP
Peter Karasik, Section Chief, DEP/DSWS
Daniel Locke, Chief, DEP/DSWS
David Lake, Special Assistant/Office of the Director, DEP
Stephen Lezinski, Engineer III, DEP/DSWS

Topic: Waste Delineation
Gude Landfill, Montgomery County
Author: Laura Jo Oakes, P.E.
Date: 17 November 2010

PURPOSE

EA Engineering, Science, and Technology, Inc. (EA) prepared this Technical Memorandum (TM) to summarize the findings of the topography and aerial map review and the Waste Delineation Study at the Gude Landfill (the Landfill) that was performed in an effort to assist the Montgomery County Department of Environmental Protection – Division of Solid Waste Services (DEP/DSWS) with the assessment and potential remediation of the site. The complete review of historical topography and aerial maps were included in the *Gude Landfill Nature and Extent Study Plan* finalized in July 2010. A complete report of findings is provided in the *Gude Landfill Waste Delineation Study,* dated January 2010.

TOPOGRAPHIC MAP AND AERIAL PHOTOGRAPHY REVIEW

Historical USGS topographic maps dated 1908, 1923, 1944, 1951, 1956, 1965, 1971, 1979, and 1984 and aerial photographs dated 1950, 1951, 1957, 1963, 1970, 1975, 1979, 1988, 1993-1996, 2005, and 2008 were reviewed in an effort to identify the limits of the Landfill.

Based on the review of available topographic maps, landfill operations began between 1956 and 1965, which is consistent with the Landfill history. By 1971, the incinerator is shown on the site topographic map. The limits of the Landfill were difficult to distinguish by the use of the historical topographic maps available for the site.

A review of the aerial photos provided visual confirmation of landfilling activities. In particular, the aerial photos illustrated areas where clearing or earthwork had been performed. In the 1963 aerial photo, clearing and earthwork activities can be identified along the northern and eastern portions of the site. In 1970, the Landfill appears to have undergone major earth moving activities throughout the site. Three large buildings appear onsite along with several large storage areas, possibly for landfill equipment. Landfill activities appear to have extended off the Landfill property boundary along the eastern edge of the site, currently owned by the Maryland-National Capital Park and Planning Commission (M-NCPPC). The 1979 aerial illustrates the extension of excavation and grading activities in the southeastern and southwestern portions of the site. Construction of a stormwater management pond is also observed in the southwest corner of Landfill. Landfill activities continue to be performed outside of the site boundary along the eastern side. Aerial maps from 1979 and 2009 are included as attachments to this TM.

WASTE DELINEATION STUDY

As a precursor to the Nature and Extent Study, EA performed a waste delineation study to locate the approximate horizontal extent of waste at the Landfill. Existing site features and historical records

indicated that waste may have been placed along and beyond the Landfill property boundary. An investigation to locate the approximate horizontal extent of waste at the Landfill was completed by EA during August through December 2009.

In order to evaluate the approximate horizontal extent of waste at the Landfill, mechanical excavation or hand auguring was performed at proposed test pit locations that were located along the Landfill property boundary. All work was performed in accordance with the health and safety plan (HASP) developed for the work.

Based on the investigation, it was determined that waste was generally placed within the Landfill property boundary in most locations, as shown on the attached figure. Waste was placed beyond the property boundary along the MNCPPC property boundary to the north and east of the Landfill, with the limit of waste approximately 200 to 250 ft from the Landfill property boundary. Surficial waste was found along the gas pipeline right of way and the Washington Suburban Sanitary Commission (WSSC) property boundary with the Landfill.

The Waste Delineation Study was referenced during the identification of groundwater well locations on the MNCPPC property to the north and east of the Landfill.

Attachments:
1979 Aerial Map
2009 Aerial Map
Waste Delineation Figure

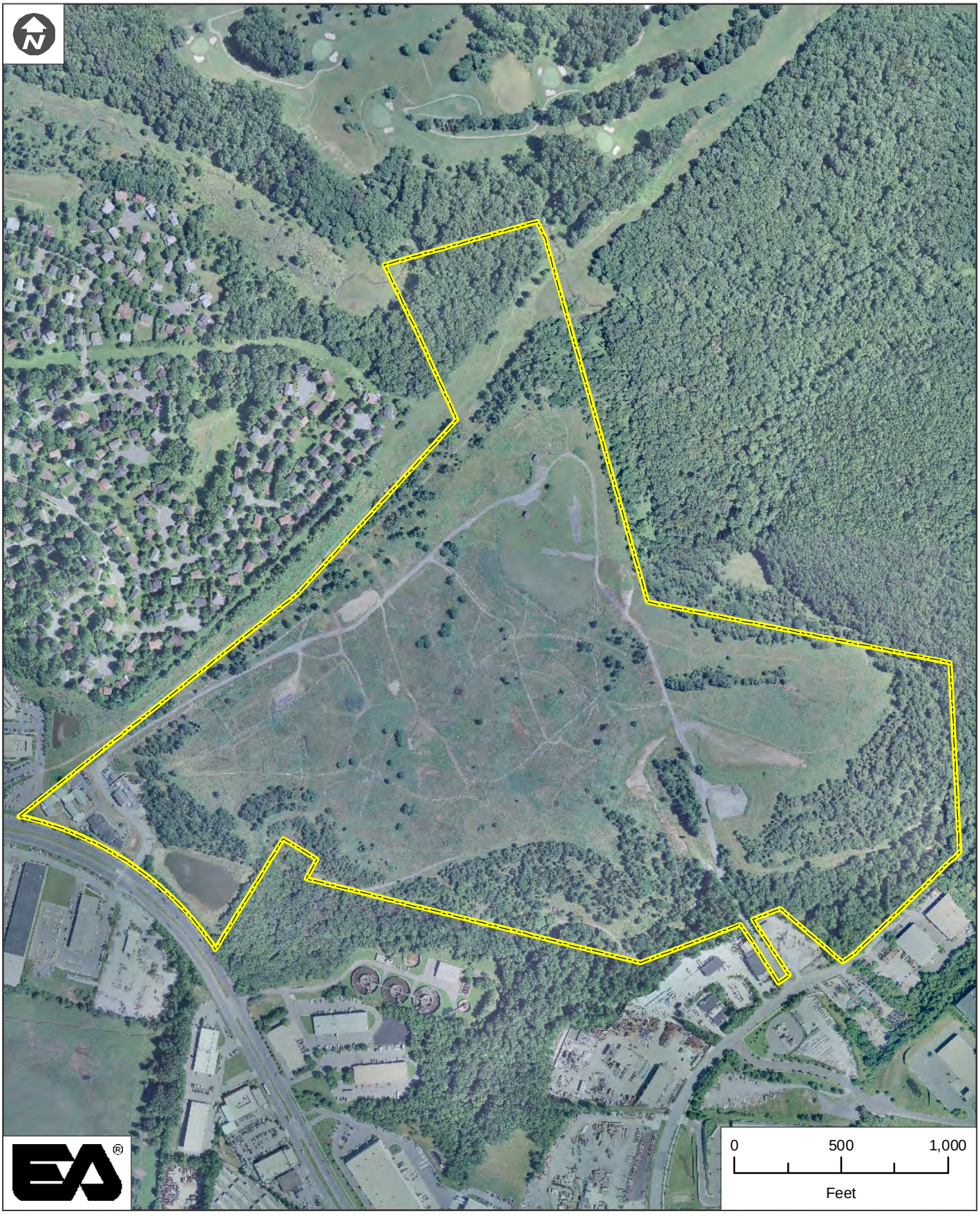
Gude Landfill
Montgomery County, Maryland

1979

*Note: The location of the property boundary has been approximated.

Source:
- EDR, 2009

H:\projects\6219605_out\MXD\EDR_Aerials



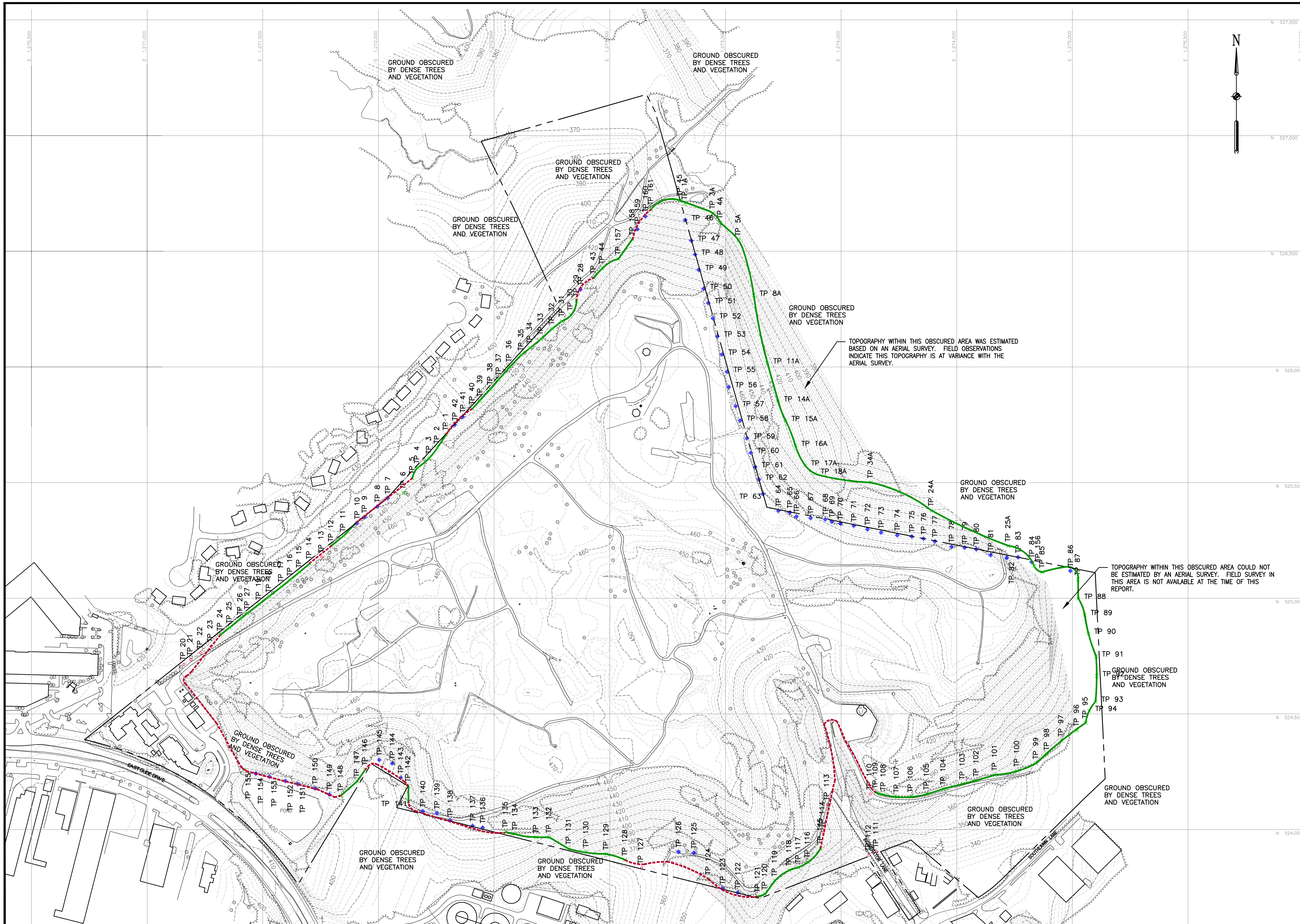
Gude Landfill
Montgomery County, Maryland

2009

*Note: The location of the property boundary has been approximated.

Source:
Applied Mapping Solutions (AMS) 2009

H:\projects\6219608_out\MXD\2009 Aerial Survey



NOTES:

1. TOPOGRAPHY COMPILED BY APPLIED MAPPING SOLUTIONS, INC. USING PHOTOGRAMMETRIC METHODS WITH PHOTOGRAPHY DATED 06/24/09 AND SUPPLEMENTED WITH FIELD SURVEY PERFORMED BY C.C. JOHNSON & MALHOTRA, P.C., OCTOBER 2009.

2. HORIZONTAL DATUM IS NORTH AMERICAN DATUM OF 1983/91 (NAD–83/91). COORDINATE SYSTEM IS MARYLAND STATE PLANE, U.S. SURVEY FEET. VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD–88) WITH ELEVATIONS SHOWN IN FEET.

3. THE PROPERTY BOUNDARY WAS LAID OUT AND THE PLAT THEREOF PREPARED BY A REGISTERED PROPERTY LINE SURVEYOR OF THE STATE OF MARYLAND, IN COMPLIANCE WITH SECTION 3–108 OF THE REAL PROPERTY ARTICLE OF THE ANNOTATED CODE OF MARYLAND, EDITION 2005.

4. THE PROPERTY BOUNDARY REPRESENTS THE LANDS OWNED BY MONTGOMERY COUNTY, MARYLAND KNOWN AS THE GUDE LANDFILL WHICH IS A COMPILATION OF THREE DEEDS, LISTED BELOW, RECORDED IN THE LAND RECORDS OF MONTGOMERY COUNTY, MARYLAND, WITHOUT BENEFIT OF FULL TITLE COMMITMENT.
   LIBER 2975 FOLIO 213
   LIBER 4501 FOLIO 453
   LIBER 5174 FOLIO 309

5. TEST PITTING WAS PERFORMED AT AN APPROXIMATE SPACING OF 50 FEET ALONG THE ASSUMED LIMIT OF WASTE WHERE THE HORIZONTAL LIMIT OF WASTE WAS TO BE DETERMINED.

6. THE HORIZONTAL LIMIT OF WASTE DEPICTED IS ESTIMATED BASED UPON TEST PIT FINDINGS AND SITE TOPOGRAPHY.

7. AT TEST PIT LOCATIONS ALONG THE ACCESS ROAD AND THE PROPERTY LINE WHERE WASTE WAS NOT ENCOUNTERED, THE HORIZONTAL LIMIT OF WASTE IS NOT DEPICTED AND IS BELIEVED TO BE WITHIN THE PROPERTY BOUNDARY.

8. AT TEST PIT LOCATIONS ALONG THE PROPERTY LINE WHERE WASTE WAS ENCOUNTERED, THE HORIZONTAL LIMIT OF WASTE IS NOT DEPICTED AND IS BELIEVED TO EXTEND BEYOND THE PROPERTY BOUNDARY.

9. TOPOGRAPHY IS APPROXIMATE IN AREAS NOTED "GROUND OBSCURED BY DENSE TREES AND VEGETATION". THE APPROXIMATED TOPOGRAPHY DOES NOT IMPACT THE DELINEATION OF WASTE IN THESE AREAS.

10. IN AREAS WHERE A DEFINITIVE LIMIT OF WASTE WAS NOT ESTABLISHED BY EA ENGINEERING, THE LIMIT OF WASTE WAS ESTIMATED BASED UPON COUNTY STAFF KNOWLEDGE.

LEGEND

10–FT CONTOUR — 400 —
2–FT CONTOUR
ESTIMATED LIMIT OF WASTE
COUNTY ESTIMATED LIMIT OF WASTE (SEE NOTE 10)
PROPERTY BOUNDARY
TEST PIT – WASTE DELINEATED × TP 148
TEST PIT – NO WASTE ENCOUNTERED ○ TP 148
TEST PIT – WASTE EXTENDS BEYOND TEST PIT ⌖ TP 148

200 100 0 200 400
GRAPHIC SCALE IN FEET

FILE PATH: (LOVETON) Q:\PROJECTS\6219605 GUDE PHASE 0\WASTE DELINEATION_REV.DWG [FIG 1] 12/4/09

Figure 1. GUDE LANDFILL WASTE DELINEATION

Topic: Aerial and Field Survey
Gude Landfill, Montgomery County
Author: Laura Jo Oakes, P.E.
Date: 17 November 2010

PURPOSE

EA Engineering, Science, and Technology, Inc. (EA) prepared this Technical Memorandum (TM) to summarize the aerial and field survey that was performed of the Gude Landfill (the Landfill) in an effort to assist the Montgomery County Department of Environmental Protection – Division of Solid Waste Services (DEP/DSWS) with the assessment and potential remediation of the site. The information contained within this TM regarding initial survey activities is also included in the *Gude Landfill Nature and Extent Study Plan* finalized in July 2010.

AERIAL AND FIELD SURVEY

As an initial phase to the Nature and Extent Study (Phase 0), aerial and supplemental field surveys were performed to provide a site survey (attached Figure). Topography was compiled by Applied Mapping Solutions, Inc. using photogrammetric methods with photography dated 24 June 2009. The mapping was compiled to meet 100 scale (1 inch equals 100 ft) and 2-ft contours per National Map Accuracy Standards[1]. Targets for the aerial survey and the additional field survey of site features were performed by C.C. Johnson and Malhotra, P.C. (CCJM). Field survey site features that were captured as part of the field survey include:

- Topography of open drainage features including benches, swales, downchutes, and ponds.
- Horizontal location and inverts of culverts, storm drains, and pond risers.
- Horizontal location, top of casing elevation, and ground surface elevation of existing groundwater (approximately 20) and LFG (approximately 7) monitoring wells.
- Horizontal location and ground surface elevation of all existing gas extraction wells and landfill conveyance piping.
- Horizontal location and elevation of LFG header pipe junctions.
- Horizontal location and ground surface elevation of building corners and fence line for flare station and power plant.

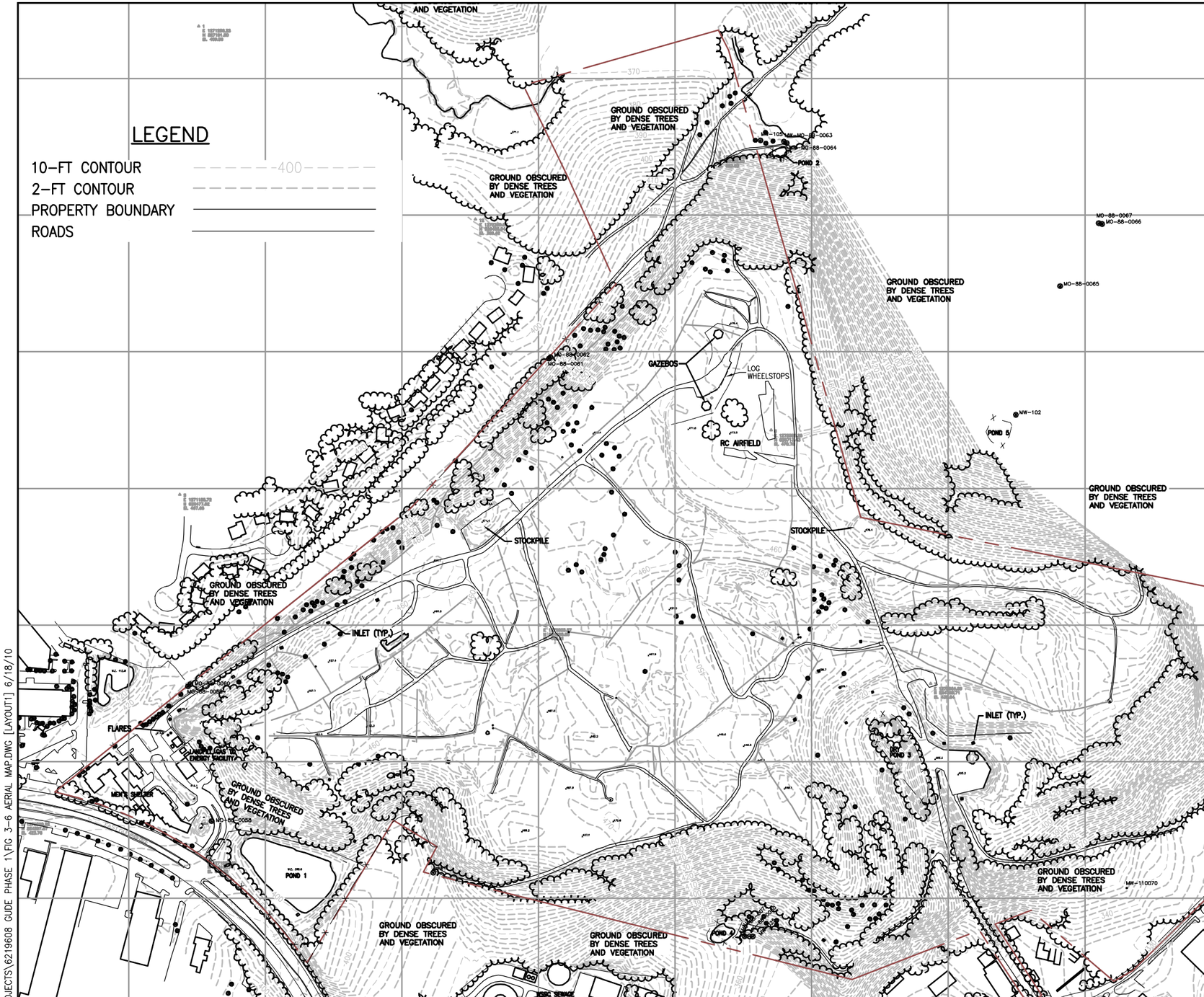
[1] United States Bureau of the Budget. 1947. *United States National Map Accuracy Standards.* Revision 2. June.

Following the implementation of the *Nature and Extent Study Plan*, additional field survey was performed by CCJM that included the following:

- Horizontal location, top of casing elevation, and ground surface elevation of 16 new monitoring wells that were installed.
- Horizontal location, top of casing elevation, and ground surface elevation of 10 new landfill gas monitoring wells that were installed by the County.

Currently, CCJM is in the process of finalizing the survey documents.

Attachments:
Survey Figure



NOTES:

1. THIS PLAN'S OUTLINE REPRESENTS THE LANDS OWNED BY MONTGOMERY COUNTY, MARYLAND AND KNOWN AS GUDE LANDFILL TOTALING 162.4139 ACRES± WHICH IS A COMPILATION OF THREE DEEDS, LISTED BELOW, RECORDED IN THE LAND RECORDS OF MONTGOMERY COUNTY, MARYLAND. WITHOUT THE BENEFIT OF FULL TITLE COMMITMENT.
   LIBER 2975 FOLIO 213
   LIBER 4501 FOLIO 453
   LIBER 5174 FOLIO 309
2. THE COURSES AND COORDINATES SHOWN HEREON ARE REFERRED TO THE NORTH AMERICAN DATUM OF 1983/91(MARYLAND STATE PLANE) (NAD-83/91) AND NORTH AMERICAL VERTICAL DATUM OF 1988 (NAVD-88) AS ESTABLISHED BY GPS POSITIONING.
3. CONTOUR INTERVAL 2' TOPOGRAPHY COMPILED BY APPLIED MAPPING SOLUTIONS, INC. USING PHOTOGRAMMETRIC METHODS WITH PHOTOGRAPHY DATED 06-24-2009. MAPPING COMPLIED TO MEET 100 SCALE AND 2 FOOT CONTOUR NATIONAL MAP ACCURACY STANDARDS. FIELD CHECK OF LFG AND DRAINAGE STRUCTURES BY C.C. JOHNSON & MALHOTRA, P.C., DATED JUNE 2009 THRU DECEMBER 2009.
4. IT IS BELIEVED BY THIS OFFICE THAT THE CONTOURING UNDER TREE CANOPY IS GROSSLY MISREPRESENTED DUE TO GROUND COVER AT TIME OF AERIAL FLYOVER.

FILE PATH: Q:\PROJECTS\6219608 GUDE PHASE 1\FIG 3-6 AERIAL MAP.DWG [LAYOUT] 6/18/10

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

GUDE LANDFILL
NATURE AND EXTENT STUDY PLAN
MONTGOMERY COUNTY, MARYLAND

FIGURE 3-5
SITE SURVEY

DESIGNED BY	DRAWN BY	DATE	PROJECT NO.
PL	JP	FEB. 2010	62196.08
CHECKED BY	PROJECT MGR.	DRAWING NO.	FIGURE
BR	JK	-	3-5

Topic: Protected Resource Investigations
Gude Landfill, Montgomery County
Author: Thomas King
Date: 30 September 2010

PURPOSE

EA Engineering, Science, and Technology, Inc. (EA) prepared this Technical Memorandum to summarize the findings of the Protected Resource Investigation at the Gude Landfill in an effort to assist the Montgomery County Department of Environmental Protection – Division of Solid Waste Services (DEP/DSWS) with the assessment and potential remediation of the site. EA has completed a detailed wetland delineation and forest stand delineation for the site and originally submitted this Technical Memorandum as an appendix to the *Gude Landfill Nature and Extent Study Plan*.

WETLAND DELINEATION

EA performed a delineation of the wetlands and/or "waters of the United States" located on and within the vicinity of the project site. The Landfill consists of approximately 120 acres, located at 600 East Gude Drive in Rockville, Maryland. In order to complete a thorough review of the wetlands/waters that could potentially be impacted, EA established an area of review to extend outside of the property boundaries and include portions of the surrounding properties. The area of review is defined on the attached *Wetland Delineation Map*.

The purpose of EA's review was to evaluate the presence and extent of wetlands/waterways with respect to federal and state jurisdictional authority. EA based its evaluation on the United States Army Corps of Engineers' (USACE) definition of "waters of the United States," and "navigable waters of the U.S.," which are defined in the Code of Federal Regulations (CFR) 33 Parts 328 and 329. EA employed the three-parameter approach set forth in the *Corps of Engineers Wetland Delineation Manual, Technical Report Y-87-01* (EL 1987) as a reference for delineating wetlands. The methodology for wetland delineation included identifying hydric soil, wetland hydrology, and dominant hydrophytic vegetation. EA also considered other regulated waters of the United States, such as ponds, lakes, streams, and rivers. If these waters were observed on the property, EA incorporated them into the nontidal wetland delineation and labeled them accordingly.

A field review to evaluate whether jurisdictional wetlands and/or waterways were present at the project site was performed. EA's field delineation of jurisdictional "waters of the U.S." consisted of identifying the limits of the wetlands and waterways with pink and black flagging, which were numbered sequentially and located using a Trimble GEO XH Global Positioning System (GPS) instrument. The flag locations and wetland/waterway boundaries are shown on the accompanying *Wetland Delineation Plan*.

On 28 and 30 October as well as 2 November 2009, EA personnel conducted an onsite review of the project site for the presence of jurisdictional wetlands and waterways. EA focused the investigation in the forested non-disturbed portion of the site around the edge of the Landfill along the existing stream valleys. However, EA performed a reconnaissance of the Landfill area and identified existing ponds and depressions that appeared to be potentially jurisdictional. A total of three wetlands and three stream channels were identified and flagged within the areas of review and are described in the following sections. In addition, EA identified multiple ponds that appeared to be previously used as stormwater management (SWM) ponds or sediment basins. However, these ponds were contained within chain link fences and not accessible during the field review, and could not be flagged in the field. Therefore, these areas were approximated on the *Wetland Delineation Plan* based on the topographic contours. Five separate "ponds" were identified during the review; however, only two of the ponds were included in the

delineation as the other three ponds were either considered non-jurisdictional or located outside of the area of review for the wetland delineation.

Delineated Features Identified Onsite

Delineated Feature	Resource	Significant Nexus Determination	Dimensions
Stream Channel #1	Perennial stream	RPW (year round)	372.25 l.f.
Stream Channel #2	Perennial stream	RPW (year round)	5,112.42 l.f.
Stream Channel #3	Ephemeral stream	Non-RPW	193.36 l.f.
Wetland System A	Emergent wetland	Abutting RPW	1,936.13 s.f. / 0.45 ac.
Wetland System B	Emergent/Forested wetland	Abutting RPW	7,535.26 s.f. / 0.17 ac.
Wetland System C	Emergent wetland	Adjacent RPW	1,342.46 s.f. / 0.03 ac.
Pond #1	Open Water Pond	Adjacent RPW	54,710.06 s.f. / 1.26 ac. **
Pond #5	Open Water Pond w/ potential emergent wetland	Adjacent RPW	8,822.75 s.f. / 0.20 ac. **
Pond #4	Open Water Pond w/ potential emergent wetland	Adjacent RPW	6,303.30 s.f. / 0.15 ac. **

** Approximate area determined from topography and aerial photography.
ac. – Acre
l.f. – Linear Feet
s.f. – Square Feet
RPW – Relatively Permanent Water

The perennial stream channels, ephemeral stream channel, and wetlands identified onsite, in EA's opinion, either exhibited characteristics of "waters of the U.S." or all three wetland parameters as defined in the 1987 Manual. In addition, EA identified multiple ponds within or adjacent to the area of review that could potentially be considered jurisdictional by USACE. However these ponds were not accessible at the time of review and therefore were approximated on the attached *Wetland Delineation Plan*.

Furthermore, the Landfill property contains an extensive system of drainage swales, inlets, pipes, and roadside ditches throughout the cleared portion of the site. EA personnel did not flag the roadside ditches or drainage swales within the cleared area of the Landfill, and it is EA's professional opinion that these areas are not jurisdictional. These features appear to have been created as part of the SWM and sediment control practices for the Landfill and appear to have been constructed through upland conditions to promote interior drainage for the Landfill. The existing drainage swales and roadside ditches did not possess an ordinary high water mark (OHWM), defined bed, or bank, nor were they part of a natural watershed. Regulatory jurisdiction typically does not extend to swales or erosional features (e.g., gullies, small washes with low volume, infrequent or short duration flow). Upland ditches (including roadside ditches) excavated wholly in and draining only uplands are generally not considered jurisdictional unless there is a surface water connection between an adjacent wetland and an RPW.

It is important to note that USACE is the federal agency that determines the official jurisdictional status of wetlands/waterways. Furthermore, the Maryland Department of the Environment (MDE) can regulate wetlands/waterways considered non-jurisdictional by USACE. To determine whether USACE or MDE will take jurisdiction over any areas of the subject property, a Jurisdictional Determination request should be submitted jointly to these agencies.

FOREST STAND DELINEATION

In addition to the Wetland Delineation described above, EA performed a full Forest Stand Delineation (FSD) on 27 and 29 October 2009. A 1/10-acre fixed plot sampling technique was used to assess forest stand conditions and forest structure. The forest stand and forest structure procedures used for data collection

followed guidelines of the State Forest Conservation Technical Manual (MD-DNR 1997). The priorities of the stands were assigned according to the guidelines in the Technical Manual. Priority 1 stands have wetlands, specimen trees, streams, steep slopes, and/or other sensitive areas. In some cases a stand can have a sensitive area within its boundaries, but be a low quality stand based upon quality of vegetation, presence of invasive species, or other values, which makes these stands Priority 2 or 3.

Four forest stands were identified within the area of review, predominantly along the perimeter of the Landfill. The cover types were red maple/tulip poplar, oak/hickory, red maple, and red cedar/black locust. Stand variations resulted from changes in topographic position, degree of slope, and amount and type of historical human disturbance. Forest stand conditions and forest structure were assessed at sample plots within the stand and described below. The attached *Forest Stand Delineation Plan* depicts the delineated limits of each forest stand and the approximate location of the sampling plots.

Delineated Forest Stands Onsite

Forest Stand	Size	Priority Rating	Successional Stage	Cover Type	Environmental Features
Forest Stand 1	4.01 ac.	Priority 1	Mature	Red maple/Tulip poplar	Specimen trees, steep slopes, stream and wetlands.
Forest Stand 2	32.82 ac.	Priority 1	Mature	Oak/Hickory	Specimen trees, steep slopes, stream and wetlands.
Forest Stand 3	5.57 ac.	Priority 2	Mid-successional	Red maple	Steep slopes
Forest Stand 4	15.54 ac.	Priority 2	Early	Red cedar/Black locust	Steep slopes

Specimen Tree List

Tree Number	Stand Location	DBH (inches)	Common Name	Scientific Name	Condition
T-1	1	38.8	White oak	*Quercus alba*	good
T-2	1	32.7	Tulip poplar	*Liriodendron tulipifera*	double trunk
T-3	2	38	White oak	*Quercus alba*	good
T-4	2	42	Scarlet oak	*Quercus coccinea*	fair

DBH – Diameter at Breast Height.

In addition to the FSD, EA completed written inquiries to the U.S Fish and Wildlife Service (USFWS), and Maryland Department of Natural Resources (MD-DNR), regarding whether they are aware of any records of rare, threatened, or endangered species present within the project boundary. EA also completed a written inquiry to the Office of Preservation and Compliance, Maryland Historical Trust (MHT) to determine whether there are known occurrences of historical, cultural, and/or archaeological sites/features present at the site. USFWS and MD-DNR have determined that no state or federal records exist for rare, threatened, or endangered species within the project area that could be impacted by the project. Furthermore, MHT has determined that there are no records regarding the presence of cultural, archaeological, or historic resources within the project area that may be affected by remedial activities.

References

Environmental Laboratory (EL), Department of the Army. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

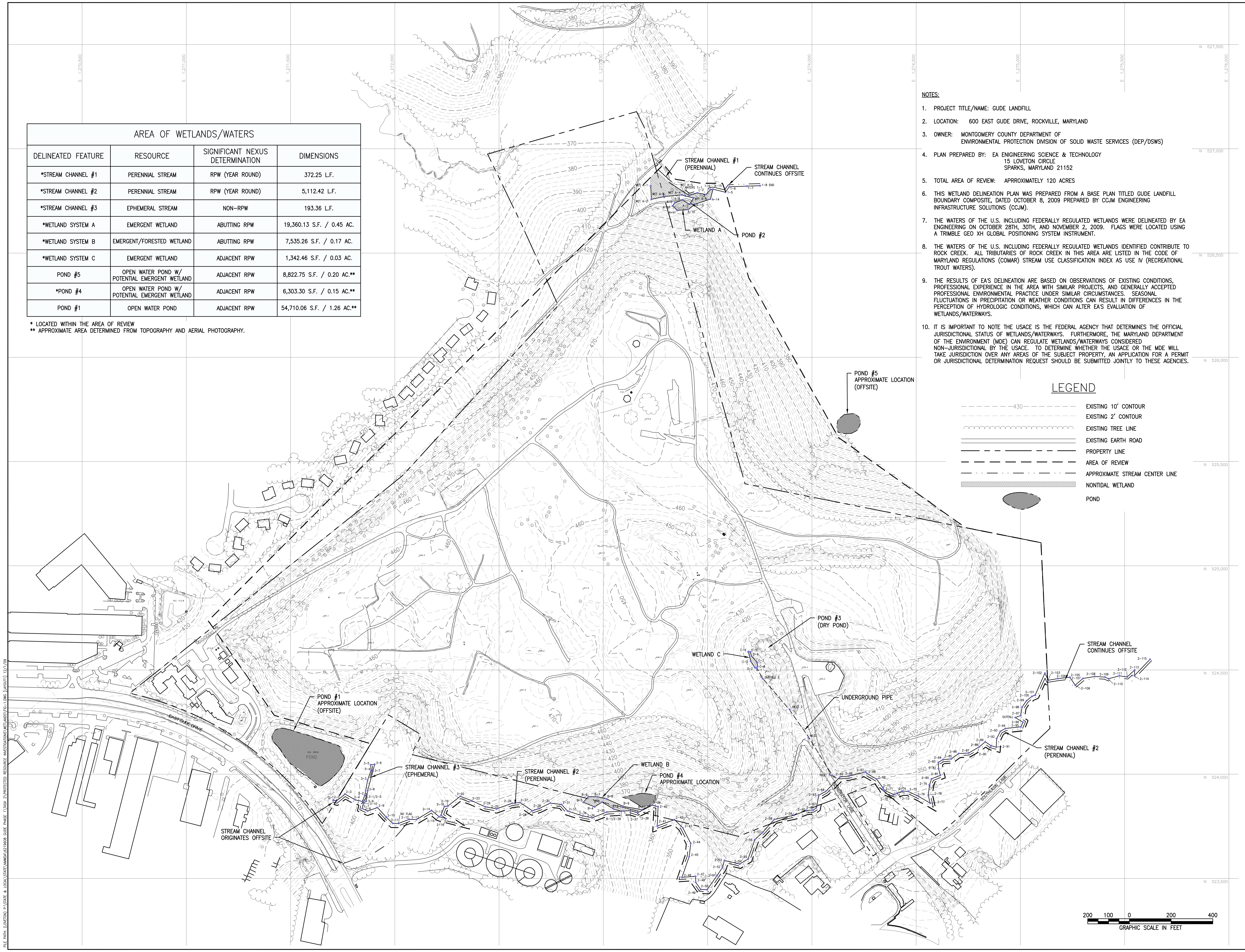
Maryland Department of Natural Resources (MD-DNR). 1997. *State Forest Conservation Technical Manual*. 3rd ed.

Attachments:
Wetland Delineation Plan
Forest Stand Delineation Plan

AREA OF WETLANDS/WATERS

DELINEATED FEATURE	RESOURCE	SIGNIFICANT NEXUS DETERMINATION	DIMENSIONS
*STREAM CHANNEL #1	PERENNIAL STREAM	RPW (YEAR ROUND)	372.25 L.F.
*STREAM CHANNEL #2	PERENNIAL STREAM	RPW (YEAR ROUND)	5,112.42 L.F.
*STREAM CHANNEL #3	EPHEMERAL STREAM	NON-RPW	193.36 L.F.
*WETLAND SYSTEM A	EMERGENT WETLAND	ABUTTING RPW	19,360.13 S.F. / 0.45 AC.
*WETLAND SYSTEM B	EMERGENT/FORESTED WETLAND	ABUTTING RPW	7,535.26 S.F. / 0.17 AC.
*WETLAND SYSTEM C	EMERGENT WETLAND	ADJACENT RPW	1,342.46 S.F. / 0.03 AC.
POND #5	OPEN WATER POND W/ POTENTIAL EMERGENT WETLAND	ADJACENT RPW	8,822.75 S.F. / 0.20 AC.**
*POND #4	OPEN WATER POND W/ POTENTIAL EMERGENT WETLAND	ADJACENT RPW	6,303.30 S.F. / 0.15 AC.**
POND #1	OPEN WATER POND	ADJACENT RPW	54,710.06 S.F. / 1.26 AC.**

* LOCATED WITHIN THE AREA OF REVIEW
** APPROXIMATE AREA DETERMINED FROM TOPOGRAPHY AND AERIAL PHOTOGRAPHY.



NOTES:

1. PROJECT TITLE/NAME: GUDE LANDFILL
2. LOCATION: 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND
3. OWNER: MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF SOLID WASTE SERVICES (DEP/DSWS)
4. PLAN PREPARED BY: EA ENIGINEERING SCIENCE & TECHNOLOGY
   15 LOVETON CIRCLE
   SPARKS, MARYLAND 21152
5. TOTAL AREA OF REVIEW: APRROXIMATELY 120 ACRES
6. THIS WETLAND DELINEATION PLAN WAS PREPARED FROM A BASE PLAN TITLED GUDE LANDFILL BOUNDARY COMPOSITE, DATED OCTOBER 8, 2009 PREPARED BY CCJM ENGINEERING INFRASTRUCTURE SOLUTIONS (CCJM).
7. THE WATERS OF THE U.S. INCLUDING FEDERALLY REGULATED WETLANDS WERE DELINEATED BY EA ENGINEERING ON OCTOBER 28TH, 30TH, AND NOVEMBER 2, 2009. FLAGS WERE LOCATED USING A TRIMBLE GEO XH GLOBAL POSITIONING SYSTEM INSTRUMENT.
8. THE WATERS OF THE U.S. INCLUDING FEDERALLY REGULATED WETLANDS IDENTIFIED CONTRIBUTE TO ROCK CREEK. ALL TRIBUTARIES OF ROCK CREEK IN THIS AREA ARE LISTED IN THE CODE OF MARYLAND REGULATIONS (COMAR) STREAM USE CLASSIFICATION INDEX AS USE IV (RECREATIONAL TROUT WATERS).
9. THE RESULTS OF EA'S DELINEATION ARE BASED ON OBSERVATIONS OF EXISTING CONDITIONS, PROFESSIONAL EXPERIENCE IN THE AREA WITH SIMILAR PROJECTS, AND GENERALLY ACCEPTED PROFESSIONAL ENVIRONMENTAL PRACTICE UNDER SIMILAR CIRCUMSTANCES. SEASONAL FLUCTUATIONS IN PRECIPITATION OR WEATHER CONDITIONS CAN RESULT IN DIFFERENCES IN THE PERCEPTION OF HYDROLOGIC CONDITIONS, WHICH CAN ALTER EA'S EVALUATION OF WETLANDS/WATERWAYS.
10. IT IS IMPORTANT TO NOTE THE USACE IS THE FEDERAL AGENCY THAT DETERMINES THE OFFICIAL JURISDICTIONAL STATUS OF WETLANDS/WATERWAYS. FURTHERMORE, THE MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) CAN REGULATE WETLANDS/WATERWAYS CONSIDERED NON-JURISDICTIONAL BY THE USACE. TO DETERMINE WHETHER THE USACE OR THE MDE WILL TAKE JURISDICTION OVER ANY AREAS OF THE SUBJECT PROPERTY, AN APPLICATION FOR A PERMIT OR JURISDICTIONAL DETERMINATION REQUEST SHOULD BE SUBMITTED JOINTLY TO THESE AGENCIES.

LEGEND

- 430 — EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREE LINE
- EXISTING EARTH ROAD
- PROPERTY LINE
- AREA OF REVIEW
- APPROXIMATE STREAM CENTER LINE
- NONTIDAL WETLAND
- POND

REVISIONS

NO.	DATE	BY	DESCRIPTION

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. _____, EXPIRATION DATE: ________.

SEAL

GUDE LANDFILL WETLAND DELINEATION
MONTGOMERY COUNTY, MARYLAND

WETLAND DELINEATION PLAN

EA ENGINEERING, SCIENCE, AND TECHNOLOGY
Loveton Center
15 Loveton Circle
Sparks, Maryland 21152
(410) 771-4950

DATE	DECEMBER 2009
DESIGNED BY	TK
DRAWN BY	JP
CHECKED BY	TK
PROJECT MANAGER	RP
PROJECT NUMBER	62196.08
DRAWING NUMBER	W-1
SHEET NUMBER	1 OF 1

FOREST STAND	SIZE WITHIN AREA OF REVIEW
1	174,495 SQ. FT. (4.01 AC.)
2	1,429,531 SQ. FT. (32.82 AC.)
3	242,818 SQ. FT. (5.57 AC.)
4	674,119 SQ. FT. (15.48 AC.)

TREE NUMBER	DBH (IN.)	COMMON NAME	SCIENTIFIC NAME	CONDITION
T-1	38.8	WHITE OAK	QUERCUS ALBA	GOOD
T-2	32.7	TULIP POPLAR	LIRIODENDRON TULIPIFERA	DOUBLE TRUNK WITH INCLUDED BARK
T-3	38	WHITE OAK	QUERCUS ALBA	GOOD
T-4	42	SCARLET OAK	QUERCUS COCCINEA	FAIR

SPECIES COMMON IN
TREES ROWS/REGROWTH ON LANDFILL
PITCH PINE
BLACK LOCUST
RED CEDAR
HONEY LOCUST
WHITE PINE

NOTES:

1. PROJECT TITLE/NAME: GUDE LANDFILL
2. LOCATION: 600 EAST GUDE DRIVE, ROCKVILLE, MARYLAND
3. OWNER: MONTGOMERY COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION DIMSION OF SOLID WASTE SERVICES (DEP/DSWS)
4. PLAN PREPARED BY: EA ENGINEERING SCIENCE & TECHNOLOGY
   15 LOVETON CIRCLE
   SPARKS, MARYLAND 21152
5. TOTAL AREA OF REVIEW: APPROXIMATELY 120 ACRES
6. THIS FSD PLAN WAS PREPARED FROM A BASE PLAN TITLED GUDE LANDFILL BOUNDARY COMPOSITE, DATED OCTOBER 8, 2009 PREPARED BY CCJM ENGINEERING INFRASTRUCTURE SOLUTIONS (CCJM).

LEGEND

- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING TREE LINE
- EXISTING EARTH ROAD
- PROPERTY LINE
- AREA OF REVIEW
- APPROXIMATE STREAM CENTER LINE
- NONTIDAL WETLAND
- POND
- S – STAND NUMBER / P – PLOT NUMBER — STAND
- STAND BOUNDARY
- SPECIMEN TREE

3/29/2010
DANIEL COCKERHAM
MD DNR QUALIFIED PROFESSIONAL ISA CERTIFIED ARBORIST MA-4435A

STREAM CHANNEL #1 (PERENNIAL)
STREAM CHANNEL CONTINUES OFFSITE
WETLAND A
POND #2
POND #5 APPROXIMATE LOCATION (OFFSITE)
POND #3 (DRY POND)
WETLAND C
UNDERGROUND PIPE
STREAM CHANNEL CONTINUES OFFSITE
STREAM CHANNEL #2 (PERENNIAL)
POND #1 APPROXIMATE LOCATION (OFFSITE)
STREAM CHANNEL #3 (EPHEMERAL)
STREAM CHANNEL #2 (PERENNIAL)
WETLAND B
POND #4 APPROXIMATE LOCATION
STREAM CHANNEL ORIGINATES OFFSITE
GUDE DRIVE

200 100 0 200 400
GRAPHIC SCALE IN FEET

N

NO.	DATE	BY	DESCRIPTION

REVISIONS

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. _____, EXPIRATION DATE: _____

SEAL

GUDE LANDFILL
FOREST STAND DELINEATION
MONTGOMERY COUNTY, MARYLAND

FOREST STAND DELINEATION PLAN

EA ENGINEERING, SCIENCE, AND TECHNOLOGY
Loveton Center
15 Loveton Circle
Sparks, Maryland 21152
(410) 771-4950

DATE	DECEMBER 2009
DESIGNED BY	DC
DRAWN BY	JP
CHECKED BY	DC
PROJECT MANAGER	RP
PROJECT NUMBER	62196.08
DRAWING NUMBER	W-1
SHEET NUMBER	1 OF 1